The New England
Journal of Medicine

Copyright, 1954, by the Massachusetts Medical Society

Volume 250 APRIL 29, 1954 Number 17

VARIETIES OF DIGITAL ISCHEMIA AND THEIR MANAGEMENT*

EDWARD A. EDWARDS, M.D.†

BOSTON

A CONSTANT or episodic lack of blood supply to the acral parts of the limbs is frequently encountered in clinical practice. The term "Raynaud's disease" is too often indiscriminately applied to such cases. Raynaud[1] did describe a clinical entity. The disease properly known by his name is characterized by digital ischemia occurring in paroxysms occasioned by exposure to cold and sometimes by emotion, without evidence of obstruction of the large limb vessels, afflicting all four limbs to some extent and existing as a chronic disorder. Unfortunately, the title of Raynaud's report—"Local Asphyxia and Symmetrical Gangrene of the Extremities" was misleading, and the cases he chose to illustrate his thesis were so varied that only a minority conformed to the criteria he himself laid down. More harmful, perhaps, was Raynaud's erroneous view that symmetry of ischemia and gangrene is necessarily indicative of functional vasospasm.

Older reports, especially those of Hutchinson,[2] Allen and Brown,[3] Lewis and Pickering[4] and Hunt,[5] have done much to help differentiate the various causes of digital ischemia. Nevertheless, the subject deserves to be discussed again, especially in the light of newer clinical knowledge.

MECHANISMS OF DIGITAL ISCHEMIA

Control of Vascular Tone

The digital arterioles and capillaries are controlled by nervous and chemical means, and may undergo constriction or dilatation. A brief consideration of these influences is pertinent to the present discussion because many of the disorders producing digital ischemia do so through vasoconstriction alone and also because, even when organic vascular disease is present, secondary constriction of the smaller vessels adds significantly to ischemia in the hands and feet.

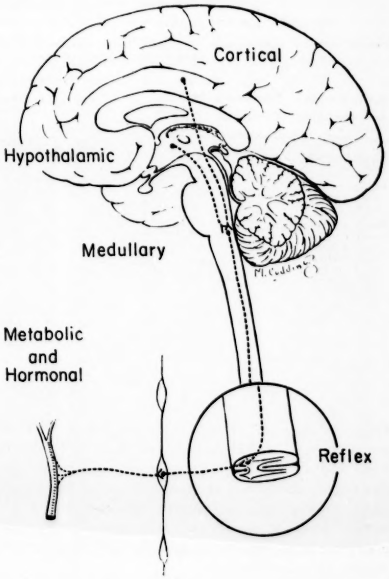


FIGURE 1. *Levels of Control of Vascular Tone.*

The vasoconstrictor nerve pathway includes cortical, hypothalamic and medullary centers, as well as the nuclei of origin of the sympathetic fibers in the spinal cord, and their further course through the sympathetic chain and somatic nerves (Fig. 1).

*From the Department of Surgery, Peter Bent Brigham Hospital, and the Department of Anatomy, Harvard Medical School.
Aided by a grant from the Massachusetts Heart Association.
Presented at the combined annual meeting of the Vermont and New Hampshire Medical Societies on October 5, 1953.

†Assistant clinical professor of anatomy, Harvard Medical School; associate in surgery, Peter Bent Brigham Hospital.

Special vasodilator fibers to the limb vessels do not certainly exist, but inhibitory influences on the vasomotor centers are known. Thus, pleasant and relaxing mental influences bring about vasodilatation, which also occurs in response to some generalized circulatory reflexes. Aside from the responses mediated by vasomotor nerves, dilatation is also produced through axon reflexes along sensory fibers, in response to local stimuli such as pressure. It is probable that the coldness of the limb in some cases of peripheral neuritis is due to the lack of these axon reflexes.

In addition to nervous connections the vessels are under a number of chemical influences, including hormones and metabolites. Epinephrine and related materials are the only potent vasoconstrictors among tremely changeable, their state at any moment depending on the balance of constrictive and dilatory forces. Pain, emotional stress, surgical shock, malnutrition and exposure to cold increase vasomotor tone. Vasoconstrictive influences are additive, and the presence of a high tone intensifies the action of a vasoconstrictive agent. Thus, Roth[6] has shown that tobacco smoking causes more vasoconstriction in the already cold hand of a hypothyroid person than in the warm hand of a hyperthyroid one. It is also noteworthy that, once digital ischemia is present, exposure to cold easily provokes further ischemia.

The diminution of vasoconstriction, on the other hand, may be brought about through a relaxed attitude, good nutrition, the recent ingestion of food, especially hot food, and general warming.

TABLE 1. *Causes of Digital Ischemia.*

PRIMARILY OBSTRUCTIVE CAUSES				PRIMARILY FUNCTIONAL CAUSES				
MAJOR ARTERIES	FINE VESSELS	BLOOD AGGLUTINATION	COLD SENSITIVITY & COLD EXPOSURE	NERVOUS SYSTEM	REFLEX CONSTRICTION	METABOLIC & ADYNAMIC	HORMONAL	PHARMACOLOGIC
Arteriosclerosis	Scleroderma	Dyscrasias (polycythemia, leukemia, thrombotic thrombocytopenic purpura)	Raynaud's disease	Stress & mental disease (livedo reticularis, hyperhidrosis, acrocyanosis)	Spinal arthritis	Rheumatoid arthritis	Hypothyroidism	Tobacco smoking
Embolism (from heart or aneurysm)	Polyarteritis		Cold urticaria	Poliomyelitis	Causalgia & minor causalgia	Malnutrition & asthenia	Castration	Ergotism
Thromboangiitis obliterans	Disseminated lupus		Trench & immersion foot	Hemiplegia	Shoulder-hand syndrome	Terminal rheumatic heart disease	Menopause	
Injury (Volkmann's contracture)	Dermatomyositis	Cold reactions (frostbite, cold agglutinins, cryoglobulinemia)		Tumor	"Vibrating-machine disease"		Addison's disease	
Neurovascular compression at root of upper limb (cervical rib & scalenus, costoclavicular & hyperabduction syndromes)	Chilblains	Idiopathic (necrotizing acrocyanosis)		Multiple sclerosis				
	Syphilis	Massive venous thrombosis		(?) Epileptic equivalent				
	Radiation injury			Peripheral neuritis				
				Post-trench-foot & post-frostbite syndromes				
				Spina bifida				

those substances. Thyroxin, testosterone, estrogen, progesterone, ACTH and cortisone are all vasodilators, and deficiency of these substances produces a diminished cutaneous perfusion. Among the metabolites, a local rise in carbon dioxide and a fall in oxygen tend to vasodilate. Histamine and related products, produced by metabolism and especially by injury, are vasodilatory.

A survey of the pharmacology of the blood vessels is not undertaken in this paper. Drugs influencing vasomotor tone act at several sites from the cerebral cortex down to the vessel proper. Two materials are of particular importance because of their widespread use: caffeine and related substances that dilate the cutaneous vessels; and the products of tobacco smoking, in which nicotine and possibly other vasoconstrictor substances are significant.

The tone and size of the digital vessels are ex-

Pathologic States Causing Digital Ischemia

Clinical disorders in which digital ischemia is encountered are classified in Table 1, according to the probably responsible mechanism. The pathology of many of these disorders has not been sufficiently investigated. To begin with, many diseases labeled functional may not be so at all. Lewis,[7] who extensively studied the pathology of Raynaud's disease, observed that necrosis was associated with thrombosis of the digital, metacarpal or metatarsal arteries. His findings neither refute nor confirm the possibility that the disease is spastic in the beginning. Lewis and Pickering[4] were convinced that thrombosis was also basic in the disease described in this paper as necrotizing acrocyanosis.[8] From my own material, I am uncertain whether such a process is always present in these cases.

The close association of organic and spastic factors must also be emphasized. Almost any organic occlusion of the arteries may set off a reflex vasoconstriction. Angiitis of the fine acral vessels is particularly apt to give rise to constriction both reflexly and by direct stimulation of the vessel network (Fig. 2).

Agglutination of cellular elements of the blood in the acral vessels is an effective precursor of necrosis. Agglutination may be suspected when a distal cyanosis is present that is difficult to relieve by elevation or stroking. The red cells are most often involved, the platelet thrombosis of thrombotic thrombocytopenic purpura being a notable exception. Fibrin probably plays no part in the production of such plugging, and it is improbable that anticoagulant drugs can prevent it.

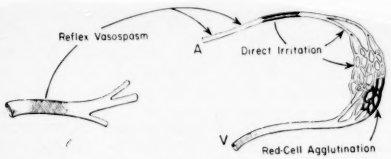


FIGURE 2. *Secondary Effects of Organic Arterial Disease on Acral Flow.*

Obstruction of a major artery (left) may give rise to reflex vasospasm and red-cell agglutination distally. Inflammation of small arteries has similar effects by direct irritation.

Blood dyscrasias are less often responsible for cellular agglutination than mere sluggishness of blood flow. Thus, Lee and Kaplan[9] reported that sludging occurred in the human subject when the velocity of the blood stream fell below 20 cm. per second. Such an agglutination is therefore a nonspecific effect of slowing by either organic obstruction or vasospasm, the agglutinated masses blocking the terminal vessels and completing the obstruction to blood flow. This view finds documentation in the histology of biopsies taken from the tips of the fingers and toes in a variety of conditions (Fig. 3). It has also been extensively described in frostbite[10] and in "vibrating-machine disease."[11]

Effects of Ischemia on the Digits

In most respects the effects of ischemia on the digits are similar, whatever the original cause. Symptoms may be constant or episodic. They may be noticeable only in the cold. Prickling, numbness and burning pain are often mentioned. Fingertip ulceration or recurrent paronychia may occur. In rare cases nail plates loosen and fall out spontaneously. Finally, blanching or cyanosis may be observed.

Objectively, the presence of color and temperature changes can be confirmed, the cyanosis and coldness

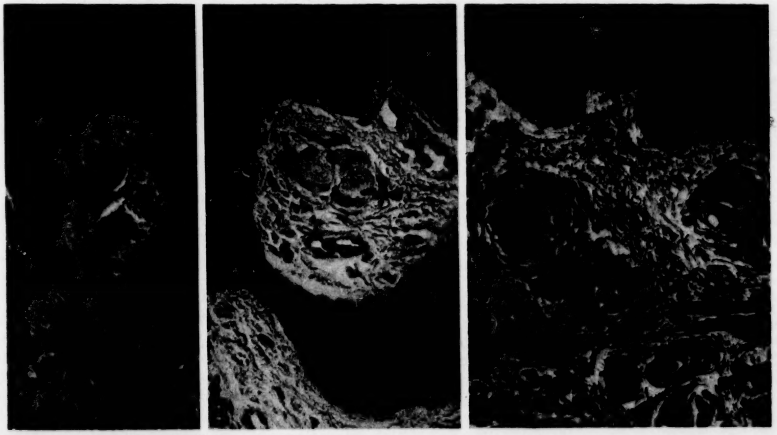


FIGURE 3. *Red-Cell Agglutination (Hyaline Thrombi) in Dermal Vessels in Raynaud's Disease* (A), *Scleroderma* (B) *and Necrotizing Acrocyanosis* (C).

In C *a hyaline thrombus is undergoing recanalization at the right; at the left an arteriole is occluded by cellular proliferation. (This change was widespread in the acral vessels in this patient.)*

often extending beyond the digits to involve the hand or foot and even more of the limbs. Long-standing ischemia results in atrophy of the pads of the fingers and toes (Fig. 4).

Certain signs suggesting predominantly vasospastic diseases (Fig. 4) are as follows: ischemia, inconstant

FIGURE 4. *Clinical Characteristics of Digital Ischemia.*

In A (in a patient with Raynaud's disease) sclerodactyly, thinning of the fingertip pads (in the thumbs) and distal necrosis are shown. In B (in a patient with arteriosclerosis and popliteal-artery thrombosis) toepad atrophy and mottling are seen. In C (in a patient with chronic effects of frostbite) exaggerated sweating, by means of a starch-iodine reaction is demonstrated. In D (in a patient with Raynaud's disease) widening of the cuticle (pterygium) is visible. In E (in a patient with scleroderma) partial loss of the tufting of the terminal phalanges is apparent.

in degree; coldness without, or out of proportion to, major pulse loss; increased sweating of the hand or foot; thinning of the skin fold at the base of the nail, which merges into a widened cuticle, or pterygium (this has been observed in both Raynaud's disease and generalized scleroderma[12]); tightness and loss of cutaneous markings and folds of the skin of the digits ("sclerodactyly") or of more of the limb ("acrosclerosis"); x-ray evidence of atrophy of the tufted ends of the terminal phalanges; and painful puckered ulcers at the very tips of the digits.

DIFFERENTIAL DIAGNOSIS

When examination has established that there is ischemia of the ends of the limbs a search for the cause is made.

Cold Sensitivity

The history is of prime importance in raising an assumption of primary cold sensitivity. Characteristic are its seasonal appearance in paroxysms related to cold exposure, the presence of ischemia to some degree in all four limbs and, at least in Raynaud's disease or cold urticaria, its chronicity and relatively benign course. Paroxysmal hemoglobinuria may accompany the symptoms in the limbs. The typical attack of vasospasm can be reproduced by chilling of the body or by immersing of the hand or foot in water at 15° C. Immersion in ice water usually fails to cause blanching, because at this temperature oxyhemoglobin does not give up its oxygen readily and perhaps also because slight vasodilatation is induced. Vasospasm usually accompanies cold urticaria. Pterygium of the nails is present in all severe grades of Raynaud's disease and often in persons who are merely "afraid of the cold."

Ischemia on exposure to cold may be due to the presence of cold agglutinins, prominent after recovery from atypical pneumonia[13] but known to occur idiopathically or in association with other infections, cirrhosis of the liver and hemolytic anemias.[14,15] Cold agglutination can be seen grossly if cold water is run over a syringe containing drawn blood. For microscopical examination the serum is added to washed red cells.

More rarely, cold agglutination is associated with cryoglobulinemia in cases of multiple myeloma or leukemia.[16-18] One can demonstrate cryoglobulin by chilling plasma for several hours in the refrigerator. In the presence of this substance a viscid deposit appears in the bottom of the test tube. The congealed plasma can be liquefied by warming.

Acrocyanosis — chronically cold, blue hands or feet, with great worsening on exposure to cold — is usually a fairly harmless variant of Raynaud's disease.[19-21] Lewis and Landis[22] concluded that arteriolar constriction alone is responsible for the cyanosis. The condition is occasionally associated with mental disturbances. In livedo reticularis the cyanosis occupies a reticulate pattern involving the entire limb. Although excessive sweating of the hands or feet may be present with vasospasm of any type, it assumes a distressing severity in hyperhidrosis, and relief is often

sought for the sweating and not for the ischemia. These patients typically suffer from severe anxiety states.

Cold-Exposure Diseases

The history should lead rapidly to a diagnosis of frostbite, trench foot or immersion foot, or of the chronic acrosclerosis and vasospasm that may follow such an incident. Chilblains, or pernio, caused by repeated exposure to freezing or near-freezing temperatures, are characterized by the recurrence each winter of painful, swollen, shiny toes, with or without tender nodules on the toes or legs that tend to ulcerate. Some cases of livedo reticularis show a similar pathology.[18,23]

One must remember that the patient may be suffering from a chronic functional or organic condition, such as Raynaud's or Buerger's disease, that predisposes him to the effects of cold exposure.[24]

Disease of Major Arteries

A history of claudication and, in Buerger's disease, superficial thrombophlebitis should raise a suspicion of organic arterial disease. Vasospasm of the fingers on exposure to cold, a frequent complaint in Buerger's disease, indicates an involvement of the vessels of the forearm or hand. The diagnosis rests almost completely on the absence or diminution of the major pulses noted by palpation or oscillometry. In the lower limbs the state of the posterior-tibial, as well as the dorsalis-pedis, pulses must be noted. Occasionally, a third artery — the perforating branch of the peroneal — is significant. In the upper limbs, the state of the ulnar, as well as the radial, artery should be determined. When one is uncertain of the ulnar pulse, the radial-artery compression maneuver of Allen[25] is helpful (Fig. 5). Finding a systolic murmur over a major artery aids in the diagnosis of arteriosclerosis.[25] Biopsy of an inflamed vein or tender nodule may establish the diagnosis of Buerger's disease.

FIGURE 5. *Allen Test for Ulnar Patency.*

The patient clenches his fists; the examiner compresses the radial arteries. When the patient relaxes his hands the right palm remains blanched because the ulnar artery is obstructed. (This patient suffered from Buerger's disease; necrosis of the thumb and tips of the little fingers is seen.)

Digital ischemia involving only one upper limb brings up the possibility of compression of the subclavian or axillary artery. If sensory disturbance is present in the ulnar side of the limb the compression is apt to be by a cervical rib or scalenus syndrome. Compression may be demonstrated by the scalenus maneuver: the head is tilted sharply backward, the occiput away from the side tested; the chin is raised to the affected side; and the shoulder is depressed by the examiner's hand while the patient takes a deep breath and holds it. When the subclavian artery is compressed a systolic murmur is heard, and sometimes there is a palpable loss of the radial pulse.[26]

The artery may be compressed, occasionally, between the clavicle and the rib (the costoclavicular syndrome of Falconer and Weddell[27]; forcible squaring of the shoulders affords a test. In the "hyperabduction syndrome" of Wright[28] the axillary artery is compressed against the coracoid process and pectoralis-minor tendon when the limb is abducted and elevated to an extreme degree.

Ischemia developing in a single hand, especially the left, weeks or months after coronary thrombosis or severe angina, particularly if accompanied by a stiff shoulder and occasionally by the onset of Dupuytren's contracture, leads to a diagnosis of the shoulder-hand syndrome.

Angiitis of Fine Vessels

Waves of vasospasm lasting days or months are common in scleroderma, dermatomyositis, polyarteritis and disseminated lupus. These symptoms may precede, by weeks or years, the appearance of the characteristics by which a diagnosis can be firmly established. An acute onset, especially in association with or occurring after rheumatic fever or rheumatoid arthritis, is common to all these disorders. Indications of widespread involvement are helpful, especially electrocardiographic signs of myocarditis, as well as albuminuria, a relative lymphocytosis, often with leukopenia, and a reversal of the albumin-globulin ratio.[29-32]

The diagnosis of any one of the disseminated angiitides may be confirmed by biopsy of an involved area of skin or muscle, but random biopsies are usually disappointing. In a number of cases I have been able to establish an early diagnosis by biopsy of the digit showing vasospasm. I use a Keyes punch in cutting the biopsy, taking the skin and subcutaneous

tissue along the side of the fingertip (Fig. 6). No serious problem in the healing of the wound has been encountered. It should be emphasized that biopsy should not be done in an area of severe ischemia and is certainly contraindicated in the presence of major organic arterial disease.

Blood Dyscrasias

Chief among the blood disorders capable of producing digital ischemia is polycythemia vera. Its increased blood viscosity may result in red-cell agglutination, with intense cyanosis of the fingers and toes. Severe arteriosclerosis and episodes of thrombosis of the arteries or veins, which are common in this disease, add to the incidence of digital changes.

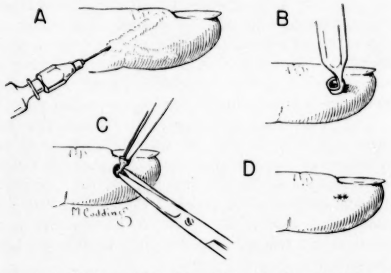


FIGURE 6. *Biopsy of the Fingertip with the Keyes Punch.*

In rare cases the leukemias and multiple myeloma cause agglutinative thrombosis in the fine digital vessels. This may be associated with the presence of cold agglutinins and cryoglobulin. Thrombotic thrombocytopenic purpura should also be thought of in idiopathic acute digital ischemias. The presence of purpura or of hemolytic anemia should raise a suspicion of this disease. The diagnosis may be confirmed by a low platelet count, a positive biopsy or a platelet agglutination test. [33-35]

Nervous-System Disease

The association of mental stress and anxiety states in inducing or aggravating vasoconstriction has been mentioned in the cases of Raynaud's disease and its variants — hyperhidrosis and acrocyanosis. It should be noted that severe chronic acrocyanosis is typical in catatonic schizophrenia, and perhaps in other depressive mental states.[19-21] The affected limb after a stroke is usually cold and pale. The ischemia is not severe enough to give rise to necrosis, and yet it probably plays a part in the cutaneous infarction seen in these patients. Again, after poliomyelitis, the limb shows a widespread and severe vasospasm, the exact mechanism of which is unclear.

Other varieties of nervous-system disease may cause vasoconstriction, often in the form of recurring evanescent attacks. In a patient observed many years ago, disappearance of the femoral pulse led to a negative exploration for an embolus. Repeated attacks of pulse disappearance followed the first.[36] Such episodes may occur with brain tumor and as a prodrome of multiple sclerosis. In some cases these attacks seem to constitute an epileptic equivalent. Finally, there are cases in which the nature of the lesion is obscure. Such a case was recently reported by Geoghegan and Mueller[37] as being due to some lesion in the diencephalon. Others, characterized by anesthesia and digital ischemia with ulceration, are possibly caused by syringomyelia. Several of these bizarre cases have been collected by Cassirer.[38]

Peripheral neuritis of any sort is a sufficient cause of vasoconstriction. Many of the symptoms that follow frostbite and trench foot are almost certainly due to a neuritis of fine nerve fibers. Infantile acrodynia is apparently caused by a neuritis resulting from mercury. There is evidence that neuritis of long standing may give rise to internal proliferation in the fine acral vessels. The mechanism of this association is unexplained.

Reflex Vasoconstriction (Causalgia, Minor Causalgia, Traumatic Dystrophy)

Irritation of almost any tissue may give rise to reflex vasospasm. Hypertrophic arthritis of the spine or limb is perhaps the commonest cause, but the vasospasm is mild in degree. Severe and more painful forms follow trauma to the extremity of widely different types, such as nerve injury, fracture and chronic exposure to a vibrating machine like a grindstone or a pneumatic hammer. The shoulder-hand syndrome is also an example of reflex vasoconstriction.

Either the simultaneous presence of several signs or the severity distinguishes these disorders from other forms of digital ischemia. These signs include an extensive hyperesthesia of the skin that is roughly glove or stocking in distribution, slight edema of the part, stiffness, reddish cyanosis and occasionally bony decalcification with scattered rounded areas of exaggerated mineral loss ("Sudek's atrophy").

Arthritis

The mild vasoconstriction of hypertrophic arthritis has been mentioned. Rheumatoid arthritis, whatever joints are affected, is often accompanied by intense acral vasoconstriction of long duration. This may precede the onset of frank joint symptoms by some years.

Late in the disease the picture may change to one of vasodilatation, suggesting liver damage.

Necrotizing Acrocyanosis

I use this term for a disorder previously mentioned in the literature under a variety of names, notably by Lewis and Pickering.[4] Twenty patients, the majority in late adult life, have been studied by me. The disease is characterized by recurrent attacks, some months in duration, of cyanosis and coldness of the hands or feet, with painful necrosis of the tips of the fingers or toes. The attacks may start at any time of the year. Some attacks are precipitated by severe illness. Pathological examination in some cases shows agglutinative thrombosis of small acral vessels and occasionally of a moderate-sized artery or vein at higher levels[6] (Fig. 3*C*).

Miscellaneous Disorders

Brief mention must be made of several diverse states. Patients with myxedema or Addison's disease, or after castration, may complain of cold hands or feet — indicative of a general lowering of surface blood flow.[39-41] The same phenomenon may be observed after the spontaneous or natural menopause, although joint pains and paresthesias may be more prominent.

Cold hands and feet are occasionally prominent during severe asthenia and malnutrition, as after extensive surgical procedures on the gastrointestinal tract. Patients in chronic heart failure from mitral rheumatic heart disease often show extreme ischemia of the fingers and toes, which become shrunken and blue, but not particularly painful.

Smoking alone seems adequate in some patients to bring about symptomatic vasospasm, which is relieved by abstinence from tobacco. Digital gangrene is occasionally seen after an overdose of ergot taken to induce abortion or to control post-partum hemorrhage, or as ergotamine tartrate, for migraine.[42-44]

Finally, the migrating venous thrombosis of visceral carcinoma may be so extensive as to give rise to gangrene of the digits.[45,46] Venous thrombosis may also produce gangrene in an arteriosclerotic limb, but the gangrene is more extensive in these cases.[47]

Treatment

It is clearly impossible to discuss the treatment of all conditions that may cause digital ischemia, but certain principles may be laid down.

Correction of the Cause

In many cases a specific cause is known and may be corrected. Examples are cold sensitivities, in which chilling may be avoided; polycythemia, in which phlebotomy will ease the perfusion of the digits; scalenus compression, which may be relieved by scaleniotomy; and extensive venous thrombosis, which may be treated by heparin, and by elevation if there is no arterial obstruction.

Vasodilatation through Nonsurgical Means

It has been emphasized that vasospasm initiates many varieties of digital ischemia and complicates many others. Moreover, even in states like arteriosclerosis, in which spasm is usually unimportant, relaxation of the vessels to a level below normal tone helps increase blood flow. The induction of vasodilatation is therefore an important goal in all cases. Physiologic steps to achieve this goal, discussed above in the section on vascular tone, are basic, and may constitute adequate therapy.

Various drugs are available for further dilatation. Alcohol should not be prescribed because it is erratic in its action, its prescription carries the danger of abuse, and the taking of a dose may be inappropriate to the patient's activities. (One should consider, for example, the consequences of advising a patient who complains of vasospasm on grasping a cold steering wheel to take a drink of whiskey before driving.) Of drugs not in the household class, dibenzyline appears the most effective. It has some side effects, including drowsiness, nasal congestion and occasionally blurring of vision. I have found it is a good plan to give 20 mg. at bedtime, 10 mg. on arising and 10 mg. in the afternoon. Dibenzyline has carried many patients, who originally had bouts of pain and necrosis, comfortably through the past two or three years.[48]

Sympathectomy

This operation is particularly desirable when ischemia is severe, and maximal and long-lasting dilatation is needed. It is most effective in predominantly vasospastic disorders, such as causalgia or the post-trench-foot syndrome, but it is extremely useful in many patients with organic disease such as arteriosclerosis. It is least effective in conditions in which organic disease progresses in the acral vessels, as in scleroderma or necrotizing acrocyanosis.

When the disorder is one amenable to the operation and affects the lower extremities, a lumbar sympathectomy is probably permanently effective. The operation has been disappointing when done in the upper thoracic region for lesions of the upper limb, and probably for two reasons. The first is a lack of appreciation of the frequency with which progressive diseases like scleroderma affect the upper extremity; too often a mistaken diagnosis of Raynaud's disease is made and sympathectomy done, only to be followed by more angiitis and sclerosis. The second difficulty is the type of operation used. Evidence is accumulating that failure to achieve uniformly the degree of sympathetic denervation possible in the lower limb has been due to a reluctance to remove the stellate ganglion (on account of the Horner syn-

drome thus produced), as well as failure to excise an adequate segment of trunk below. Collaterals exist for the sympathetic pathways of both the upper and lower limbs. Fewer collaterals will remain after the removal of long portions of the sympathetic chain: the stellate ganglion through the third or fourth thoracic segment for the upper limb and the first through the fourth lumbar segment for the lower limb.

Repeated procaine sympathetic blocks are of occasional and limited use in vasospasm of recent origin, as in acute vascular obstructions and in the shoulder-hand syndrome.[49,50]

Conclusions

Ischemia of the fingers and toes may be occasioned by a great variety of diseases.

There is considerable uniformity of color, temperature, sensory and atrophic effects of ischemia even though the causes may be diverse.

The differential diagnosis can usually be made on the basis of a careful history and physical examination. Laboratory examinations are only occasionally essential. The correction of the basic fault is often possible. In some cases, a diagnosis cannot be established when the patient is first seen, and further observation must accompany palliative treatment.

Many disorders give rise to digital ischemia through vasospasm. Others that organically occlude the vessels often cause considerable secondary spasm. Even when spasm is not prominent, relaxation of the vessels aids in promoting acral blood flow.

Three approaches are available for the relief of vasospasm: physiologic maneuvers, such as mental relaxation, warmth and the avoidance of tobacco, are basic. Dibenzyline is a useful vasodilator drug; and sympathectomy is ideal when the disorder is not one of progressive organic disease of the acral vessels. The operation is probably as good for the upper as for the lower extremities, provided the variety of disease is properly appraised and an adequate length of sympathetic chain removed.

330 Dartmouth Street

References

1. Raynaud, M. Local asphyxia and symmetrical gangrene of the extremities. In *Selected Monographs*. London: New Sydenham Society, 1888. Pp. 1-199.
2. Hutchinson, J. Symmetrical acro-sphacelus without Raynaud's phenomena. *Arch. Surg. London* **7**:201-209, 1896.
3. Allen, E. V., and Brown, G. E. Raynaud's disease: clinical study of 147 cases. *J.A.M.A.* **99**:1472-1478, 1932.
4. Lewis, T., and Pickering, G. W. Observations upon maladies in which blood supply to digits ceases intermittently or permanently, and upon bilateral gangrene of digits; observations relevant to so-called "Raynaud's disease." *Clin. Sc.* **1**:327-366, 1934.
5. Hunt, J. H. Raynaud phenomena: critical review. *Quart. J. Med.* **5**:399-444, 1936.
6. Roth, G. M. *Tobacco and the Cardiovascular System: The effects of smoking and of nicotine on normal persons.* 66 pp. Springfield, Illinois: Thomas, 1951.
7. Lewis, T. Pathological changes in arteries supplying fingers in warm-handed people and in cases of so-called Raynaud's disease. *Clin. Sc.* **3**:287-319, 1938.
8. Edwards, E. A., McAdams, A. J., Jr., and Leary, O. J. Remittent necrotizing acrocyanosis. *Proc. Am. Heart A.*, 1953. P. 61.
9. Lee, R. E., and Kaplan, L. R. Capillary bed in man and its functional changes in essential hypertension, in hypertension with "Cushing's syndrome," and in pheochromocytoma. Presented at the annual meeting of the American Heart Association, Atlantic City, New Jersey, April 11, 1953.
10. Friedman, N. B. Reactions of tissue to cold: pathology of frostbite, high altitude frostbite, trench foot and immersion foot. *Am. J. Clin. Path.* **16**:634-639, 1946.
11. Gurdjian, E. S., and Walker, L. W. Traumatic vasospastic disease of hand (white fingers) with particular reference to biopsy findings. *J.A.M.A.* **129**:668-672, 1945.
12. Edwards, E. A. Nail changes in functional and organic arterial disease. *New Eng. J. Med.* **239**:362-365, 1948.
13. Peterson, O. L., Ham, T. H., and Finland, M. Cold agglutinins (autohemagglutinins) in primary atypical pneumonia. *Science* **97**: 167, 1943.
14. Stats, D., and Wasserman, L. R. Cold hemagglutination—interpretative review. *Medicine* **22**:363-424, 1943.
15. Bateman, J. C. Symptoms attributable to cold hemagglutination. *Arch. Int. Med.* **84**:523, 1949.
16. Lerner, A. B., and Watson, C. J. Studies of cryoglobulins. I. Unusual purpura associated with presence of high concentration of cryoglobulin (cold precipitable serum globulin). *Am. J. M. Sc.* **214**:410-415, 1947.
17. Barr, D. P., Reader, G. G., and Wheeler, C. H. Cryoglobulinemia. I. Report of two cases with discussion of clinical manifestations, incidence and significance. *Ann. Int. Med.* **32**:6-29, 1950.
18. Wright, I. S. Pathogenesis and treatment of thrombosis. *Circulation* **5**:161-188, 1952.
19. Stern, E. S. Acrocyanosis. *J. Ment. Sc.* **83**:408-436, 1937.
20. Altschule, M. D., and Sulzbach, W. M. Effect of carbon dioxide on acrocyanosis in schizophrenia. *Arch. Neurol. & Psychiat.* **61**: 44-55, 1949.
21. Shattock, F. M. Somatic manifestations of schizophrenia: clinical study of their significance. *J. Ment. Sc.* **96**:32-142, 1950.
22. Lewis, T., and Landis, E. M. Observations upon vascular mechanism in acrocyanosis. *Heart* **15**:229-246, 1930.
23. Allen, E. V., Barker, N. W., and Hines, E. A. *Peripheral Vascular Diseases*. 871 pp. Philadelphia: Saunders, 1946.
24. Edwards, E. A., and Leeper, R. W. Frostbite: analysis of seventy-one cases. *J.A.M.A.* **149**:1199-1205, 1952.
25. Edwards, E. A., and Levine, H. D. Peripheral vascular murmurs: mechanism of production and diagnostic significance. *Arch. Int. Med.* **90**:284-300, 1952.
26. *Idem*. Auscultation in diagnosis of compression of subclavian artery. *New Eng. J. Med.* **247**:79-81, 1952.
27. Falconer, M. A., and Weddell, G. Costoclavicular compression of subclavian artery and vein: relation to scalenus anticus syndrome. *Lancet* **2**:539-543, 1943.
28. Beyer, J. A., and Wright, I. S. Hyperabduction syndrome, with special reference to its relationship to Raynaud's syndrome. *Circulation* **4**:161-172, 1951.
29. Griffith, G. C., and Vural, I. L. Polyarteritis nodosa: correlation of clinical and postmortem findings in seventeen cases. *Circulation* **3**:481-491, 1951.
30. *Idem*. Acute and subacute disseminated lupus erythematosus: correlation of clinical and postmortem findings in eighteen cases. *Circulation* **3**:492-500, 1951.
31. Baehr, G., and Pollack, A. Diffuse vascular diseases. *Mod. Concepts Cardiovas. Dis.* **15**: No. 12, 1946.
32. Beigelman, P. M., Goldner, F., Jr., and Bayles, T. B. Progressive systemic sclerosis (scleroderma). *New Eng. J. Med.* **249**:45-58, 1953.
33. Moschcowitz, E. Acute febrile pleiochrome anemia with hyaline thrombosis of terminal arterioles and capillaries. *Arch. Int. Med.* **36**:89-93, 1925.
34. Fitzgerald, P. J., Auerbach, O., and Frame, E. Thrombocytic acroangiothrombosis (platelet thrombosis of capillaries, arterioles, and venules). *Blood.* **2**:519-541, 1947.
35. Tullis, J. L. Platelet antibody tests in diagnosis of purpura. *New Eng. J. Med.* **249**:591-595, 1953.
36. Edwards, E. A. Non-arterial disorders simulating disease of peripheral arteries. *New Eng. J. Med.* **225**:91-101, 1941.
37. Geoghegan, T., and Mueller, E. J. Diencephalic autonomic attacks: report of case with predominantly sympathetic manifestations. *New Eng. J. Med.* **247**:841, 1952.
38. Casmier, R. *Die vasomotorisch-trophischen Neurosen*. Second edition. 988 pp. Berlin: Karger, 1912.
39. Edwards, E. A., Hamilton, J. B., Duntley, S. Q., and Hubert, G. Cutaneous vascular and pigmentary changes in castrate and eunuchoid men. *Endocrinology* **28**:119-128, 1941.
40. Edwards, E. A., and Duntley, S. Q. Cutaneous vascular changes in women in reference to menstrual cycle and ovariectomy. *Am. J. Obst. & Gynec.* **57**:501-509, 1949.
41. Edwards, E. A. Analysis of skin color in living human subjects by spectrophotometric means. In *Pigment Cell Growth: Third conference on the biology of normal and atypical pigment cell growth*. 365 pp. Edited by M. Gordon. New York: Academic Press, 1953.
42. Barger, G. *Ergot and Ergotism: A monograph based on the Dohme lectures delivered in Johns Hopkins University, Baltimore*. 279 pp. London: Gurney & Jackson, 1931.
43. von Storch, T. J. C. Complications following use of ergotamine tartrate; relation to treatment of migraine headache. *J.A.M.A.* **111**:293-300, 1938.
44. Comfort, M. W., and Erickson, C. W. Untoward effects from use of ergot and ergotamine tartrate. *Ann. Int. Med.* **13**:46-60, 1939.
45. Edwards, E. A. Migrating thrombophlebitis associated with carcinoma. *New Eng. J. Med.* **240**:1031-1035, 1949.
46. Haimovici, H. Gangrene of extremities of venous origin: review of literature with case reports. *Circulation* **1**:225-240, 1950.
47. Edwards, E. A. Atypical manifestations of peripheral arteriosclerosis. *New Eng. J. Med.* **247**:627-631, 1952.
48. Friend, D. G., and Edwards, E. A. Use of "dibenzyline" as vasodilator in patients with severe digital ischemia. *Arch. Int. Med.* (in press).
49. Bayles, T. B., Judson, W. E., and Potter, T. A. Reflex sympathetic dystrophy of upper extremity (hand-shoulder syndrome). *J.A.M.A.* **144**:537-542, 1950.
50. Steinbrocker, O., Neustadt, D., and Lapin, L. Shoulder-hand syndrome: sympathetic block compared with corticotropin and cortisone therapy. *J.A.M.A.* **153**:788-791, 1953.

RENAL FAILURE WITH EXTREME HYPERPOTASSEMIA*

Its Treatment With Exchange Transfusions

RICHARD B. GOLDBLOOM, M.D.†

MONTREAL, QUEBEC

THE basic purpose of therapy in acute renal failure is to reduce the accumulation of toxic substances until there is sufficient return of renal function to maintain homeostasis. To this end, a variety of technics for artificial dialysis have been developed. The simplest of these involves irrigation of the gastrointestinal tract or peritoneal cavity with a dialyzing solution. More recently, the favored method has been the use of some form of "artificial kidney," in which the blood is circulated extracorporeally through an artificial semipermeable membrane in the presence of a suitable dialyzing solution. These methods have several disadvantages. They require expensive apparatus, a well trained team of operators and meticulous laboratory control. Furthermore, the calculated dialyzing solution may not adequately fulfil the requirements of the particular patient.

This report is concerned with a case of severe renal shutdown in which the exact stage of kidney damage could not be definitely determined on clinical grounds. This patient was of particular interest, first because the electrocardiogram showed as extreme evidence of hyperkalemia as has been recorded in man with survival and, secondly, because, although the illness terminated fatally, it was possible to maintain life for forty-two days of extreme oliguria and anuria through the use of repeated exchange transfusions.

CASE REPORT

M.B., a 10-year-old girl, was admitted to the Children's Memorial Hospital on November 1, 1952, because of easy fatigability and pains in the legs that had begun 3 weeks previously. Six days before admission she began to have persistent painless hematuria, backache and vomiting. There was no history of antecedent urinary symptoms, infection or ingestion of drugs.

Physical examination showed a pale, listless girl with moderate facial edema. There was questionable tenderness in the right costovertebral angle. No other significant findings were recorded.

The temperature was 98°F., the pulse 100, and the respirations 24. The blood pressure was 114/80.

Examination of the blood revealed a hemoglobin of 7.8 gm. per 100 cc. and a white-cell count of 10,000, with a slight shift to the left in the differential. The corrected sedimentation rate was 34 mm. per hour (Wintrobe method). The urine was grossly bloody and gave a ++++ test for albumin. The sediment contained innumerable red blood cells and 3 to 5 white blood cells per high-power field, as well as rare granular casts (uncentrifuged specimen). An old-tuberculin test in 1:1000 dilution was negative, as was a Kline test.

X-ray examination of the chest was negative. A plain film of the abdomen showed the kidney shadows to be slightly larger than normal.

The blood chemical constituents included a nonprotein nitrogen of 140 mg. and creatinine of 11.8 mg. per 100 cc. and a carbon dioxide of 20 milliequiv., sodium of 122 milliequiv. and chloride of 91 milliequiv. per liter. The total protein was 7.0 gm., with an albumin of 4.3 gm. and a globulin of 2.7 gm. per 100 cc.

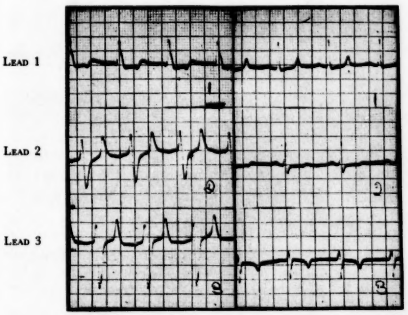


FIGURE 1. *Electrocardiogram on the Fourth Hospital Day. Before treatment* (A) *standard leads show abnormal P waves, widened QRS complexes, depressed ST segments in Lead 1, tall T waves in Leads 2 and 3, and prolongation of QT ratio (0.501). After injection of 50 cc. of 50 per cent glucose solution with 5 units of insulin* (B) *standard leads show return of electrocardiogram toward normal, with normal QRS complexes and QT ratio of 0.424.*

Cultures of the nasopharynx and urine revealed no significant pathogens.

During the 1st 4 days the patient remained listless, with intermittent vomiting. The urine output ranged between 120 and 280 cc. per 24 hours. On the 4th day the serum potassium was 7.7 milliequiv. per liter. An electrocardiogram gave evidence of fairly severe hyperkalemia, with tall, peaked T waves, absent P waves and prolongation of ventricular systole. She was given 50 cc. of 50 per cent glucose solution and 5 units of insulin intravenously. A short time later the electrocardiogram showed reversion to an essentially normal pattern (Fig. 1). The serum potassium had fallen concurrently to 6.65 milliequiv. per liter. Before the injection of glucose and insulin she had been restless and perspiring profusely. Within 30 minutes of the injection she was considerably relaxed, and perspiration was greatly diminished.

She was maintained on a high-calorie, high-carbohydrate, low-potassium intake, with fluids restricted to an amount approximately equivalent to the sum of the insensible and excretory losses. Salt intake was regulated on the basis of frequent determinations of serum sodium and chloride.

On the 5th hospital day her condition had deteriorated. She was cold and perspiring profusely. The pulse was weak and occasionally irregular. The serum potassium was 8.9 milliequiv. per liter. An electrocardiogram showed ab-

*From the departments of pediatrics, Children's Memorial Hospital and McGill University, Faculty of Medicine.

†Hosmer Teaching Fellow, Department of Pediatrics, McGill University Faculty of Medicine.

normal rhythm at a rate of 88 per minute, wide QRS complexes, absent P waves and large T waves. This progressed rapidly to ventricular tachycardia and then to total disorganization of the electrocardiographic pattern, with few clearly recognizable complexes. At this point, with continuous electrocardiographic recording, an intravenous injection of 50 cc. of 50 per cent glucose and 5 units of insulin was begun. Figures 2 and 3 demonstrate the progressive return, 1 minute after the injection, to a normal pattern approximately 15 minutes after the beginning of the injection. There had been no evidence from her general

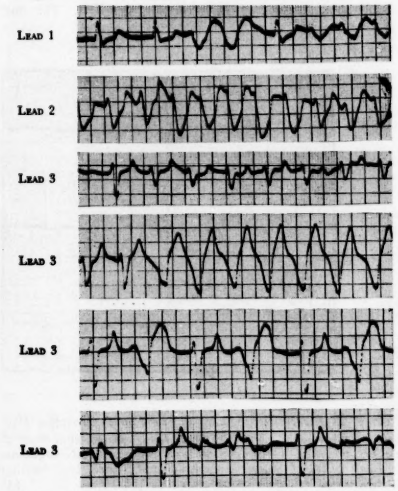


FIGURE 2. *Electrocardiogram on the Fifth Hospital Day. Sections of a continuous tracing taken over a sixteen-minute period immediately before the administration of glucose and insulin are shown.*

appearance that the patient was in extreme danger of cardiac arrest, as was indicated by the electrocardiogram.

From the 5th day onward urine output was less than 35 cc. a day, and from the 10th to the 17th day, inclusive, she was totally anuric. She required a further injection of hypertonic glucose for the control of hyperkalemia. She was also given 2 large colonic irrigations on the 6th day. The serum potassium subsequently fell and remained within normal limits.

By the 17th hospital day the nonprotein nitrogen had risen to 290 mg. and the creatinine to 27.5 mg. per 100 cc. Since no apparatus for artificial dialysis was available it was decided to attempt an exchange transfusion. This was done on the 17th day, with polyethylene tubing inserted into the left saphenous vein (withdrawal) and the right antecubital vein (replacement). Carefully cross-matched, citrated, fresh donor blood was used, and 2 cc. of 10 per cent calcium gluconate solution was injected intravenously after the replacement of each 200-cc. volume of blood. Over the next 5 days 4 exchange transfusions were given. The volume of blood exchanged varied between 2270 and 4670 cc. at each transfusion.

The results of these procedures are partially presented in Figure 4. There was a striking fall in nonprotein nitrogen and creatinine levels, and after the first exchange transfusion, there was a 24-hour urine output of 150 cc. This followed a period of 8 days of complete anuria. The hemoglobin, which had fallen to 6.3 gm. per 100 cc., rose to 11.3 gm. by the end of the 1st transfusion. The resulting clinical improvement was remarkable. The patient, who had been semicomatose, irritable and vomiting before the first exchange transfusion, was sitting up in bed and avidly reading the latest comic books less than 24 hours later. Her color was much improved, and her appetite had returned.

Unfortunately, the general improvement was of brief duration. The nonprotein nitrogen, which had fallen from 290 to 95 mg. per 100 cc. after the 2d exchange transfusion, began to rise rapidly, and within 2 days her condition had deteriorated markedly. Generalized clonic convulsions, which were not controlled by calcium gluconate and were assumed to be due to cerebral edema, developed. Sedation was maintained with paraldehyde by rectum. Additional therapy consisted of prophylactic antibiotics, daily injections of components of the vitamin B complex and testosterone proprionate, 25 mg. on alternate days. The serum sodium and chloride tended to remain below normal levels throughout most of the illness, whereas the serum calcium was rarely below 7.4 mg. per 100 cc.

No evidence of pericarditis was demonstrated clinically or by electrocardiogram. There was no significant elevation of blood pressure except during the terminal 48 hours of the illness.

The last exchange transfusion had only transient effect, and the azotemia soon increased progressively. The patient

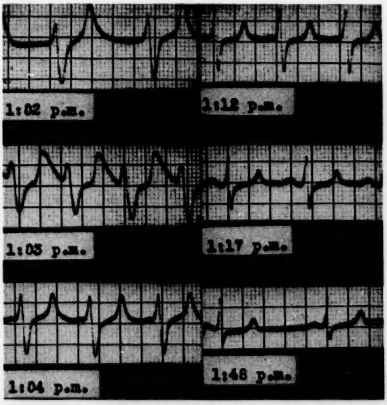


FIGURE 3. *Tracing Taken after That in Figure 2 at the Beginning of the Injection of 50 cc. of 50 per cent Glucose with 5 Units of Insulin.*

Injection was made at 1:02 p.m., with progressive and rapid return of the electrocardiogram to normal.

went into semicoma, with periodic twitching of the extremities. There was considerable pruritus, nosebleeds and later bloody diarrhea. She died quietly, 42 days after admission.

At post-mortem examination the gross anatomic findings included acute hemorrhagic colitis, hydroperitoneum, congestion and edema of the lungs, slight cardiomegaly, fibrinous perisplenitis, numerous ecchymotic areas of skin and scattered hemorrhages in the brain. The kidneys were of normal size and pale, and the capsules stripped easily. The right kidney weighed 90 gm. (normal, 92 gm.), and the left 113 gm. (normal, 95 gm.).

Microscopically, no normal glomeruli were seen. A few glomeruli were highly cellular and bloodless, but contained no inflammatory cells; there was extensive epithelial crescent formation. The remainder showed varying degrees of fibrosis, from basement-membrane thickening to focal or diffuse scarring without hyalinization (Fig. 5).

There was fairly extensive tubular dilatation, alternating with groups of normal tubules, as well as scattered areas of tubular atrophy. Some of the dilated tubules contained albuminoid material. The interstitium comprised scattered foci of inflammatory reaction, made up of lymphocytic and monocytic cells.

The histologic diagnosis was subacute (2d-stage) glomerulonephritis.

Discussion

Death was probably inevitable, judging by the degree of kidney damage demonstrated at autopsy.

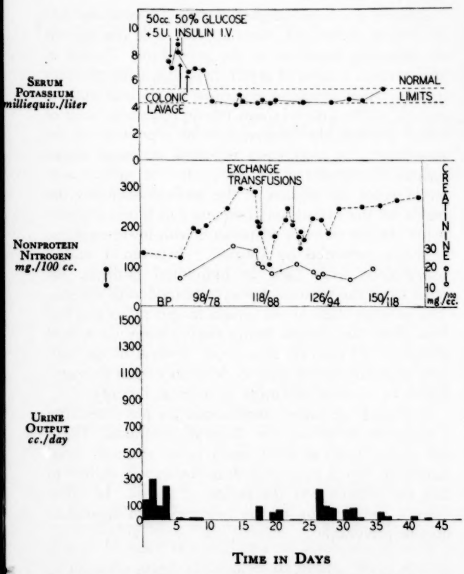


Figure 4. *Effects of Hypertonic Glucose and Insulin on Serum Potassium Levels, and of Repeated Exchange Transfusions on the Nonprotein Nitrogen, Creatinine and Urine Output.*

However, certain features of the course and the therapy provide instructive information that should be valuable in the handling of patients with severe renal failure.

With the exception of persons who have accidentally received overdoses of potassium salts intravenously the occurrence of clinical potassium intoxication is nearly always confined to patients with severe renal failure. In such patients the serum potassium levels may be normal, low or increased, depending on such factors as intake, cellular depletion and relative efficiency of renal excretion. However, despite the serum level at any particular time, the tolerance for potassium in the face of severe renal insufficiency may be greatly limited. This observation led Keith and Osterberg[1] to recommend the use of a potassium

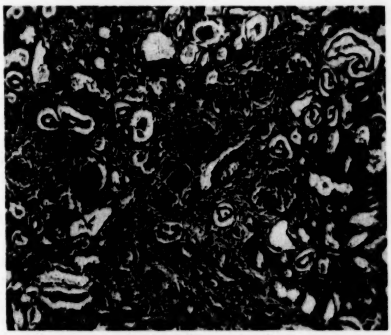


Figure 5. *Section of the Kidney, Showing Areas of Tubular Atrophy and Collapse Fibrosis, Tubular Dilatation, and Several Glomeruli in Various Stages of Alteration (Hematoxylin and Eosin Stain ×50).*

tolerance test in patients in whom the blood urea exceeded 100 mg. per 100 cc. The implications for dietary potassium intake are clear.

The signs and symptoms of hyperkalemia are variable and unreliable. Although listlessness, paresthesias, ashen pallor, bradycardia, peripheral vascular collapse and paralysis have been described, correlation between the degree of hyperkalemia and the appearance of clinical signs is poor. Furthermore, the signs and symptoms, if present at all, may be almost indistinguishable from those of hypokalemia. It has been repeatedly demonstrated that there is little correlation between the degree of elevation of serum potassium and the degree of alteration recorded in the electrocardiogram.[2-4] This point is well illustrated by the fact that the patient described above, at a time when the serum potassium was 8.9 milliequiv. per liter, showed electrocardiographic changes that were much more striking than those recorded by Govan and Weiseth[5] in a child with a serum potassium of 12.27 milliequiv. per liter.

The lack of correlation between serum values and effects on myocardial function is partly due to the fact that potassium is primarily an intracellular ion, and deviations in concentration are therefore not necessarily reflected by measurements performed on extracellular fluid. However, the correlation between electrocardiographic changes and measurements of myocardial potassium has likewise been found variable.[4] Darrow[6] has therefore suggested that the gradient of intracellular and extracellular potassium con-

centration may be the determining factor in the potential differences developing in cell membranes.

The practical fact remains that death from potassium intoxication in renal insufficiency may occur with dramatic suddenness and without warning. Serial electrocardiograms provide the chief indication of the severity of myocardial involvement, once it has been determined that hyperkalemia is present.

Treatment may be divided into two phases: the emergency management of extreme hyperkalemia and maintenance therapy or prophylaxis.

The use of hypertonic glucose solutions combined with insulin is probably the safest and most rapidly effective treatment of severe potassium intoxication. The lowering of serum potassium by this means is due to the uptake and intracellular transfer of potassium in the process of glycogenesis. Approximately 0.36 millimol of potassium is said to be deposited with each gram of glycogen.[6]

The electrocardiographic changes in the case reported above immediately before the second injection of 50 per cent glucose and insulin (Fig. 2) showed at one point merely huge waves of depolarization and repolarization. This tracing was strikingly similar to those recorded by Marchand and Finch[7] a few minutes before death in patients with potassium intoxication in uremia. The repeated and rapid correction of such severe conduction disturbances with intravenous infusions of glucose and insulin was little short of dramatic.

Additional emergency measures may include the use of intravenously administered 10 per cent calcium gluconate solution and of intestinal irrigation. Prophylaxis and maintenance of normal levels of serum potassium are further aided by means of a diet low in potassium and nitrogen and high in calories and carbohydrate, and by the use of cation-exchange resins and testosterone.

Repeated exchange transfusions in the treatment of uremic azotemia have been reported for the most part from European centers. Bessis,[8] in 1949, recorded the results of over 190 exchange transfusions in children and adults as treatment for conditions besides hemolytic disease of the newborn. He considered exchange transfusions to have several advantages. In contrast to dialyzing methods the transfusion removes nondialyzable as well as dialyzable toxic products. Serum electrolyte levels tend to return to normal, and are not severely modified, as with dialyzing procedures. The method is relatively rapid and painless, and can be used as often as necessary. Finally, the amount of nonprotein nitrogen that will be removed by each procedure can be roughly calculated.

It might be added that, partly as a result of the considerable amount of sodium citrate in the transfused blood, much of the acidosis that occurs in patients with renal failure tends to be corrected.[9]

Salisbury and Miller[10] described the effect of exchange transfusion in dogs given a hundred times the M.L.D. of mercuric chloride. They showed that the transfusions were effective in lowering the nonprotein nitrogen in uremic animals. If the transfusions were begun within ninety minutes of ingestion of the poison the animals remained clinically well. If begun within one hundred and eighty minutes they became ill, but eventually recovered.

Tzanck, Bessis and Dausset[11] reported 95 cases of "anuric nephritis" (due to a variety of conditions) treated with a total of 296 exchange transfusions. Fifteen patients were treated during exacerbations of subacute or chronic nephritis with the purpose of tiding them over the acute episode. This was successful in 7 cases. In some cases the therapy was combined with dialysis. Out of the entire series 55 patients recovered fully.

Despite the large number of such transfusions that have been performed, there appear to be few reports of disturbing reactions to the procedure. Tzanck et al.[11] present 3 cases of serum hepatitis, with recovery in all. Other reactions described by various authors include chills, urticaria and febrile reactions, none of which prevent the continuation or repetition of the procedure. In most cases repeated exchange transfusions are necessary for the control of uremic azotemia, since the efficacy of the method obviously depends on the extent and frequency of blood replacement. In the series of 44 patients with lower-nephron nephrosis reported by Dausset,[12] between 1 and 8 transfusions were used in individual patients. In some cases the treatment was combined with dialysis. The average duration of anuria in this series was sixteen days, the longest being twenty-three days, and 29 out of 44 patients recovered. Several of the failures were considered due to delay in exchange transfusion or to prior attempts at surgical therapy.

Repeated exchange transfusions do not constitute a complete substitute for dialyzing methods. There are undoubtedly a great many cases of acute renal failure in which exsanguinotransfusion will suffice to tide the patient over the period of anuria. In other cases a combination of the two modes of treatment may be preferable.

Summary

A case of severe renal failure in a ten-year-old girl, who died after forty-two days of extreme oliguria and anuria, is presented. This patient showed as extreme electrocardiographic evidence of hyperkalemia as has been reported in man with survival.

The recognition, treatment and prophylaxis of hyperkalemia in acute renal failure is discussed. The rapid efficacy of hypertonic glucose solutions and insulin intravenously was repeatedly demonstrated, with dramatic clinical and electrocardiographic improvement. It is emphasized that the electrocardiogram may be the only indicator of the precarious state of the patient, once hyperkalemia is known to exist. Fre-

quent tracings under such circumstances will gauge the degree of potassium intoxication, which may otherwise result in sudden and unexpected death.

The value of repeated exchange transfusions in the treatment of uremic anuria is stressed. In addition to the technical simplicity of the procedure, as compared with dialyzing methods, the specific advantages of correction of anemia, acidosis and electrolyte balance are enumerated.

I am indebted to Dr. F. W. Wiglesworth for assistance with the pathological material, and to Drs. A. L. Johnson and C. Ferencz for help in interpretation of the electrocardiograms.

References

1. Keith, N. M., and Osterberg, A. E. Tolerance for potassium in severe renal insufficiency: study of ten cases. *J. Clin. Investigation* **26**:773-783, 1947.
2. Currens, J. H., and Crawford, J. D. Electrocardiogram and disturbance of potassium metabolism. *New Eng. J. Med.* **243**:843-850, 1950.
3. Keith, N. M., and Burchell, H. B. Clinical intoxication with potassium: its occurrence in severe renal insufficiency. *Am. J. M. Sc.* **217**:1-12, 1949.
4. Crismon, J. M., Crismon, C. S., Calabresi, M., and Darrow, D. C. Electrolyte redistribution in cat heart and skeletal muscle in potassium poisoning. *Am. J. Physiol.* **139**:667-674, 1943.
5. Govan, C. D., Jr., and Weiseth, W. M. Potassium intoxication: report of infant surviving serum potassium level of 12.27 millimoles per liter. *J. Pediat.* **28**:550-553, 1946.
6. Darrow, D. C. Blood-fluid physiology: role of potassium in clinical disturbances of body water and electrolyte. *New Eng. J. Med.* **242**:1014-1018, 1950.
7. Marchand, J. F., and Finch, C. A. Fatal spontaneous potassium intoxication in patients with uremia. *Arch. Int. Med.* **73**:384-390, 1944.
8. Bessis, M. Use of replacement transfusion in diseases other than hemolytic disease of newborn. *Blood* **4**:324-337, 1949.
9. Snapper, I., and Schaefer, L. E. Treatment of two patients with hepatorenal syndrome and acute renal failure by exsanguinotransfusion. *Ann. Int. Med.* **34**:692-704, 1951.
10. Salisbury, P. F., and Miller, J. H. Cross transfusion: therapeutic effect in acute mercury nephrosis. *Proc. Soc. Exper. Biol. & Med.* **74**:16-19, 1950.
11. Tzanck, A., Bessis, M., and Dausset, J. Résultats du traitement des néphrites anuriques par les exsanguinotransfusions. *Bull. et mém. Soc. méd. d. hôp. de Paris* **66**:1225-1230, 1950.
12. Dausset, J. Lower nephron nephrosis: report of treatment of forty-four patients by repeated replacement transfusions. *Arch. Int. Med.* **85**:416-431, 1950.

VALUE OF ELECTRIC-SHOCK TREATMENT ON OUTPATIENTS

Robert R. Mezer, M.D.,* and Harry C. Solomon, M.D.†

BOSTON

A survey of outpatient electric-shock treatment at the Southard Clinic of the Boston Psychopathic Hospital for two years (November, 1949, through October, 1951) is presented to evaluate the worth of such a program. If electric shock for outpatients is successful, it is a tremendously economical procedure, for it saves not only the expense of hospitalization, but also the loss of income from work. It avoids the stigma for the patient of being in a mental hospital, the loss of freedom, and the legal consequences, such as being deprived of a driver's license and being forced to remain in the state for a year after discharge.

The procedure for instituting treatment follows naturally upon completion of the diagnostic interviews. If shock is considered advisable the patient is given a thorough physical examination, x-ray studies of the chest and spine, and an electrocardiogram. Each patient is seen by a psychiatrist and a psychiatric social worker before and after each treatment. The member of the family who calls for the patient to take him home is interviewed concerning the patient's progress between treatments.

In our two-year experience, of 93 patients who were started on shock treatment, 9 (10 per cent) broke treatment. This figure is below that of patients receiving psychotherapy who discontinue treatment after a few interviews. Of the 84 patients who completed a full course of treatments, 73 (87 per cent) improved and 11 (13 per cent) were unimproved. When these patients were divided into three diagnostic categories—affective, paranoid, and mixed psychoses—the following results were obtained: affective, 61 treated, 55 (90 per cent) improved, and 6 (10 per cent) unimproved; paranoid, 10 treated, 6 (60 per cent) improved, and 4 (40 per cent) unimproved; mixed, 14 treated, 13 (92 per cent) improved, and 1 (8 per cent) unimproved.

Of the 11 unimproved patients, 8 were admitted to the Boston Psychopathic Hospital for further study; 3 were hospitalized elsewhere. Five of the 8 patients failed to improve despite additional electric-shock treatments or a course of insulin therapy and were transferred to other hospitals for chronic care. Two of the 3 patients who improved received further electric-shock treatment, and 1 recovered spontaneously; it is worth noting that in all 3 there were unpleasant situations in the homes and that even after improvement the patients were extremely reluctant to leave the hospital. Of the 3 patients hospitalized elsewhere, 1 was hospitalized after only two shocks and responded to fifteen treatments in the hospital; 1 failed to respond to additional treatment; and the third was removed from the hospital by her family against advice.

The complications were divided into two groups: those resulting directly from the shock treatment—for example, fractures; and those occurring as a result of aggravation or exacerbation of some pre-

*Assistant in psychiatry, Harvard Medical School; assistant physician, Boston Psychopathic Hospital.

†Professor of psychiatry, Harvard Medical School; medical director, Boston Psychopathic Hospital.

existing lesion—for example, in cardiac, tuberculous and pulmonary patients. Three of the patients suffered compression fractures—of the fifth dorsal, fourth thoracic, and seventh and eighth thoracic vertebras; 2 of these completed the series with modified treatment, and the other patient was improved enough not to require further treatment. Three of the patients suffered exacerbations of pre-existing physical disease—2 with cardiac and 1 with pulmonary lesions. These patients were all given modified shock treatments from the beginning with full awareness of the dangers involved. Five other patients with physical abnormalities treated with modified shock treatment did not experience exacerbations of their symptoms. The total number of complications resulting from shock treatment was 6 (7 per cent).

Modifications of the program of outpatient shock treatment included the use of various drugs (Myanesin and C-10) and maintenance shock treatment. The drugs, by softening the convulsion, enabled the treatment of patients with physical disabilities. Maintenance shock treatment was found particularly valuable in patients who relapsed shortly after a course of intensive treatment. Shocks at intervals of one or two months enable some patients to maintain a state of well-being.

A major advantage of outpatient shock treatment is the minimal cost, for it avoids the expense of hospitalization, which for similar patients has an average length of six weeks. Furthermore, many of these patients are able to continue working during the treatment period.

Summary and Conclusions

In a two-year survey (November, 1949, through October, 1951) of outpatient electric-shock treatment on 84 patients 87 per cent were considered improved. Complications resulting from treatment occurred in 7 per cent. Four of the 11 patients who failed to improve with outpatient treatment did improve with additional treatments with electric or insulin shock while hospitalized.

The over-all conclusions are that an outpatient electric-shock program is worth while therapeutically and financially and that it is less disturbing to the patient and the family. It is believed that such a program should be available in general hospitals and should be seriously considered before patients are admitted to mental hospitals.

Bibliography

Holt, W. L., Jr., Rinkel, M., Greenblatt, M., and Anderson, R. Myanesin in electric shock: studies in rabbits and man. *Am. J. Psychiat.* **105**:834-839, 1949.

Stevenson, G. H., and Geoghegan, J. J. Prophylactic electroshock: 5-year study. *Am. J. Psychiat.* **107**:743-748, 1951.

MEDICAL PROGRESS

THE COMMON COLD (Concluded)*

Robert S. Gohd, Ph.D.†

BOSTON

Resistance and Susceptibility

The factors that determine the resistance and susceptibility to infection with the cold virus are virtually unknown. The low percentage of "takes" in experimental studies on human volunteers has indicated that at any one time approximately half the normal population was resistant to the cold virus. Dochez et al.[7] reported an attack rate of 44 per cent in their experiments. The cold virus employed by Feller and his associates[12] was characterized by an attack rate of 60 per cent. Andrewes and his co-workers[27] believe that the resistance of the population may vary from year to year. At the start of their investigations in 1947, 55 to 60 per cent of the human volunteers became infected with colds. In the following years the number of "takes" gradually declined until, in 1953, the low value of 30 per cent was reported. Thus, it appears that currently 70 per cent of the volunteers were resistant to infection. Whether or not this resistance is related to immune circulating antibodies is not known. Although the chimpanzee resisted reinfection with the cold virus for as long as three or four months after the first attack[7] the same fact apparently was not true of human beings.[17] A clear example of a lack of resistance to reinfection with the cold agent was furnished by the experiments conducted by the Commission on Acute Respiratory Diseases[11] in which colds were induced in a number of volunteers. Nineteen days later, when 5 of the volunteers were reinoculated with the same agent, colds again developed in 4 of the 5. Andrewes[13] mentions that serum from convalescents contained substances that reduced the infectivity of the cold virus. It could not be stated that this activity was due to specific antibodies. In fact, Andrewes believed

*From the Virus Laboratory, Department of Otolaryngology, Massachusetts Eye and Ear Infirmary.

†Research fellow in bacteriology and immunology, Harvard Medical School; research virologist, Massachusetts Eye and Ear Infirmary.

that resistance to cold infection was unrelated to the time elapsed after the last attack of the disease.

A result that apparently differed from the investigations described above was reported by Pollard and Caplovitz.[20] In their study volunteers who had contracted experimental colds were resistant to reinfection with the same agent thirteen days later. In the same study several volunteers were immunized with allantoic fluid that contained cold virus. One week after the last immunizing dose resistance was found when they were given an intranasal inoculation of nasal secretions containing active virus.

Certain epidemiologic studies of cold infections in isolated communities are suggestive of a resistance after an infection.[31,32] At Spitsbergen[31] it was reported that the population was free of cold infections for several months when there was no contact with the outside world. When contact was established by outside shipping in the spring an epidemic of colds was started. The incidence of colds did not decline much until after the last ship had left in the fall, and once again the population was virtually free of colds during the ensuing winter. Thus, it seemed that the cold virus was unable to maintain itself in small, isolated communities. Whether the resistance of the population was either an expression of an effective but ephemeral immunity on the part of the host or a loss of virulence on the part of the agent remained unknown. In Spitsbergen in the spring the situation was reversed, and the population appeared universally susceptible to the disease, which presumably was brought in by the first ship. It could not be stated that this susceptibility was due to an imperfect immunity of the population, for the relation between the viral agent of the current year and the agent of the previous year could not be ascertained. If the viruses were not related, it would be expected that no protection would be afforded by a previous attack.

On the basis of epidemiologic studies[33,34] and of personal experience many have considered physical factors, such as chilling, draughts, wet feet, exposure and fatigue, either to be responsible for or to predispose the patient to the development of cold symptoms. That these factors of themselves cause colds has never been demonstrated. Andrewes[13] has attempted to evaluate the effect of physical factors on experimentally induced colds. In his experiments one group of volunteers was chilled only; a second group received virus alone, and a third group was chilled but also received virus. It appeared that chilling alone caused no colds. Colds were as frequent in those who were inoculated with virus alone as in those who were both chilled and treated with virus. This experience indicated to Andrewes that under controlled conditions physical factors that reduced a patient's resistance failed to increase his susceptibility to experimental colds.

In conclusion it may be stated that the mechanisms that determine the resistance and susceptibility of man to infection with the cold virus are still unknown. Evidence for the development of an immunity that follows an infection is equivocal. An immunity, if present at all, persists for an exceedingly short time, possibly no longer than two weeks.

Prophylaxis and Therapy

There are no chemotherapeutic or antimicrobial agents that will prevent or alter the course of infections caused by the virus of the common cold. Bacterial vaccines, sulfonamides, antibiotics and, more recently, antihistamines have been advocated for the prophylaxis or treatment of cold infections. Numerous large-scale investigations, which were well conceived and carefully controlled to eliminate the factors of bias on the part of both the investigator and those who were treated, have failed to confirm the original observations.

Several critical reviews have dealt with various aspects of the prevention and treatment of cold infections.[2, 3, 35, 36] Finland[35] has reviewed the effects of chemotherapeutic and antimicrobial substances on the common cold. As might have been expected these substances were effective in the treatment of secondary bacterial invaders. However, it was concluded that the agents did not prevent or alter the clinical course of the cold infection. Finland and Cecil, Plummer and Smillie[37] objected to the indiscriminate use of antimicrobial agents in the prevention or treatment of colds. Finland[35] suggested that they may be employed usefully to prevent secondary infections during epidemics of hemolytic streptococci or other virulent bacteria that are susceptible to antimicrobial treatment. Antimicrobial agents may also prove to be of prophylactic value (against the secondary infection) in selected cases in which there are histories of sinusitis and otitis media or in which cold symptoms are protracted and persist longer than ordinary colds.

In the reviews by Hilding[3] and Greenspan[2] the efficacy of immunization procedures with bacterial vaccines has been considered. The opinion of these authors was that vaccines were not of value in the prevention of colds. Cold symptoms were not ameliorated in immunized persons, and the course and duration of colds in this group were no different from those in the unvaccinated controls.

In recent years the reports of several investigators indicated that antihistamines were effective for both the prevention and the treatment of common colds.[38-40] Because improper controls were employed in these studies the validity of their conclusions was questioned.[41] Subsequently, numerous large-scale, carefully controlled experiments were recorded.[12, 42-47] The results of these reports failed to confirm the earlier work. Controls were always benefited to the same extent as those who took "therapeutic" doses of antihistamines. Those who advocated the use of anti-

histamines mentioned that beneficial results were most frequently observed when treatment was started early in the disease — that is, as soon as symptoms were manifest.

This aspect was examined experimentally both by Feller et al.[12] and by Andrewes.[48] Feller and his associates[12] reported that antihistaminic treatment in the first experiment was instituted two hours before the intranasal inoculation of human volunteers with cold virus. In the second experiment three doses of antihistamines were given before the inoculation. The antihistamine regimen was such that four doses were taken daily, and the treatment was continued for five days. Therefore, treatment began twenty-four to forty-eight hours before symptoms developed. Under such conditions a maximum beneficial effect was to be anticipated. No effect was observed. The antihistamines failed to prevent experimentally induced colds. The severity, duration and course of the colds was not altered by antihistamines. Andrewes[48] had a similar experience. Thus, the efficacy of antihistamines as either prophylactic or therapeutic agents has not been demonstrated in either naturally occurring or experimentally induced colds.

Surgical procedures designed to provide an adequate airway and promote drainage of the nasal sinuses have been suggested as a possible prophylactic measure for the prevention of secondary infections in the advent of a cold.[49]

Diagnosis

There are no specific clinical symptoms or laboratory tests that will definitely establish the diagnosis of the common cold. The possibility that a cytologic examination of nasal secretions would help in the diagnosis was mentioned above.[29, 30] However, a correlation between the cytology and infectivity of the nasal secretions has not been established, and the validity of the suggestion must await an experimental trial in human volunteers.

Topping and Atlas[23] and Ward and Proctor[24] demonstrated the growth of cold virus in embryonated eggs. Since an effect of cold virus on the embryos could not be demonstrated by pathological or serologic technics an attempt was made to detect the presence of virus by chemical procedures. Atlas and Hottle[50] reported that when allantoic fluids containing cold virus were treated with tryptophane and perchloric acid, the optical density of the specimens at a wave length of 500 millimicrons was higher than normal allantoic fluids. Ward,[51] who employed methods that were identical to those of Atlas and Hottle, was unable to confirm their results.

Ward[51] also employed radioactive phosphorus in his studies. Embryonated eggs were inoculated by the allantoic route first with radioactive phosphorus and then with cold virus. Controls received radioactive phosphorus and a sterile diluent. After a suitable incubation period allantoic fluids were harvested and analyzed for the distribution of radioactive phosphorus in the following phosphate fractions: acid soluble, phospholipid, ribonucleic acid and desoxyribose nucleic acid. The ratio of ribonucleic acid to acid-soluble phosphate of infected allantoic fluid was compared with the values obtained from control fluids. In several experiments fluids containing virus had a higher ratio than controls. In other experiments, for some unexplained reason, the values for controls were no different from those of fluids with virus. Thus, it appears that these laboratory methods are without confirmation, or else they are beset by technical difficulties. Certainly, additional work is required before these technics can be accepted for general application.

The only certain method for demonstrating the virus of the common cold is by reproducing the disease in human beings. This method is not practical for large-scale investigations. The best approach for such studies appears to be the one described by Feller et al.[12] and Dingle and his associates.[52] Their method is mentioned in more detail because it illustrates the nature of the detailed information that was accumulated and used to establish the diagnosis of infection.

These authors[12, 52] have conducted an investigation of upper respiratory infection in families. At the start of the study a complete medical history was obtained from each person. Thereafter, a record of the presence or absence of symptoms was made in the home. At the onset of any illness a physician visited the home and defined the illness by history and physical examination. Field workers checked the records of each family each week. Bacterial cultures were obtained from the pharynx at weekly intervals and also at the onset of each illness. Pharyngeal swabs were put into broth, which was examined for the presence of influenza virus. White-cell counts and roentgenograms of the chest were also obtained. In this manner allergic rhinitis, bacterial infection with either the pneumococcus or the beta-hemolytic streptococcus and the viruses of influenza, primary atypical pneumonia, common cold and undifferentiated respiratory disease were considered before a differential diagnosis was made. If the clinical symptomatology was compatible with the diagnosis of common cold and if the results from the laboratory failed to implicate any of the known pathogenic micro-organisms, the diagnosis was common cold. Thus, the diagnosis of a cold depended on the combined information obtained from family and field-worker reports, observations of a physician, laboratory analysis of microbial cultures and other special laboratory tests.

Epidemiology

The common cold has a ubiquitous geographic distribution. There are few places in the world where the virus has not invaded. It has been found in the tropics, the temperate zones[53] and the Arctic Cir-

cle.[31, 32] Colds may occur at any time of the year. However, depending on the locality, there appear to be seasonal variations in the incidence of the disease. In the United States colds occur more frequently in the fall and in the early spring.[54,55] Small, isolated communities in the Arctic Circle have enjoyed a freedom from colds for many months during the winter, provided their isolation was maintained and no contacts were made with either explorers[32] or outside shipping.[31] In Spitsbergen[31] colds were prevalent during the summer months when the shipping lanes were open.

The morbidity of colds is exceedingly high. Reports on the incidence have ranged from averages of 1[55] to more than 6[52] a year for each person. The average number of colds for each patient may be related to his status in the family. In an investigation of acute upper respiratory diseases in urban families, Dingle et al.[52] presented the following observations: the average rate of occurrence of respiratory disease in the population was 4.7 attacks for each person per year; children had nearly twice as many colds as adults — 5.86 as against 3.44; mothers had approximately twice as many colds as fathers — 4.12 to 2.76; if only children of pre-school age were in the family they had an attack rate of 4.86; if there were also school-age children in the family, the pre-school child contracted two extra colds each year, or a rate of 6.72; and school-age children had a rate of 6.09. These observations suggest that the school-age child may introduce colds into the family. Andrewes[48] has speculated on the school-age child as a vector in the dissemination of colds.

Colds are highly contagious and are spread by contact from case to case. The epidemiologic studies of Paul and Freese[31] on the arctic island of Spitsbergen illustrated clearly both the contagiousness and the epidemic nature of the cold. The first ship that docked in the spring at the port of Longyear City usually brought an epidemic of colds. The epidemic was charted, and the spread of colds directly to the inhabitants of the town was observed. In less than four weeks virtually three fourths of the community had contracted colds.

Colds are considered to be spread either by fomites or by direct contact with droplets of nasal secretions. This theory appears reasonable since virus has been demonstrated repeatedly in nasal secretions obtained from patients with colds. Attempts by Andrewes[13, 50] and by Kerr and Lagen[57] to transmit colds under controlled experimental conditions have generally met with failure. In an experiment in which 19 volunteers were exposed to 4 persons with experimentally induced colds, only 1 of the group contracted a cold.[13] In a second series of experiments, conducted on an island, 16 volunteers failed to contract colds when they were exposed either by direct contact with persons with colds or by indirect contact with fomites that had been handled by those with experimental colds.[56] The highly contagious character of naturally occurring colds has been mentioned.[31, 32] The reasons for the negative results in controlled transmission experiments remain unexplained.

Discussion

Although the common cold occurs more frequently in man than any other disease the virus remains one of the most poorly understood agents. The reason for this is the requirement of human beings for experimental purposes. In spite of this handicap, distinct progress has been made in studies on the etiology of the cold. Recent large-scale investigations have demonstrated unequivocally that many colds are caused by a filterable virus. In a study of the characteristics of this virus—its stability, filterability and size —and the clinical disease it produces in human beings and its experimental hosts, the weight of evidence indicates that both man and the chimpanzee are susceptible to cold infections. Less convincing is the evidence for growth of virus either in embryonated eggs or in tissue cultures.

Factors that govern the resistance and susceptibility of man to infection with the cold virus are virtually unknown. Approximately half an experimental population has resisted the induction of experimental colds. That this resistance was due to an immune phenomenon has not been demonstrated. The immunity that apparently develops after infection is of short duration, possibly for no longer than two weeks.

There are no chemical or biologic substances that will prevent or influence the course of the common cold. Immunization procedures by any of several routes with bacterial vaccines, vitamins and antimicrobial agents have not prevented the development of colds. The course, severity and duration of colds when they occurred were not altered by these procedures. The earlier results of some investigators indicated that antihistamines were effective in the prevention and treatment of colds. Recent studies, some of which were on a large scale, have clearly demonstrated that these substances have no value in either prophylaxis or therapy.

There is no single laboratory procedure or clinical symptom that will definitely establish the diagnosis of a common cold. The diagnosis depends on the demonstration of a filterable agent in suspected nasal secretions. This is done by inoculation of filtrates of such material into human volunteers. The development of clinical features of the cold in these volunteers establishes the diagnosis. In an indirect approach the diagnosis is established by the exclusion of other disorders or infections whose clinical symptoms resemble those of the common cold. Information from carefully taken case histories, physical examinations, x-ray studies and laboratory analyses of suspected material for infectious micro-organisms is required before this kind of diagnosis can be considered valid.

Conclusion

One cannot escape the conclusion that progress in the understanding of the common cold has not been conspicuous, at least when it is compared to the recent advances in the study of the viruses of poliomyelitis and influenza. In virology as in other sciences progress proceeds only as rapidly as its methodology. In this respect the methods for studying the cold virus have been static. Human beings are still required for experimental purposes. Although recent investigations have suggested that the cold virus may be grown in the chick-embryo or tissue culture, the reliability of the methods has not been ascertained. Until investigators can rely on simple laboratory procedures to study the virus, knowledge of the common cold will accrue slowly and require much effort.

References

31. Paul, J. H., and Freese, H. L. Epidemiological and bacteriological study of "common cold" in isolated Arctic community (Spitsbergen). *Am. J. Hyg.* **17**:517-535, 1933.
32. Heinbecker, P., and Irvine-Jones, E. I. M. Susceptibility of Eskimos to common cold and study of their natural immunity to diphtheria, scarlet fever, and bacterial filtrates. *J. Immunol.* **15**:395-406, 1928.
33. Schade-Kiel, H. Untersuchungen in der Erkältungsfrage. II. Die Einzelformen der Erkältung und die Erkältungsdisposition. *München. med. Wchnschr.* **67**:449-454, 1920.
34. Brown, W. B., Graham, I. Niedringhaus, A., and Locke, A. Nonspecific factors of resistance. VI. Incidence of common cold in persons with and without the accessory symptomatology of non reaginic food-allergy. *J. Immunol.* **46**:101-111, 1943.
35. Finland, M. Antimicrobial treatment for viral and related infections. II. Antibiotic treatment of acute respiratory infections and influenza. *New Eng. J. Med.* **247**:557-567, 1952.
36. Burrage, W. S. Antihistamines: their use and abuse. *New Eng. J. Med.* **245**:532-537, 1951.
37. Cecil, R. L., Plummer, N., and Smillie, W. G. Sulfadiazine in treatment of common cold. *J. A. M. A.* **124**:8-14, 1944.
38. Gordon, J. S. Antihistaminic drugs in treatment of upper respiratory tract infection. Laryngoscope **58**:1265-1273, 1948.
39. Brewster, J. M. Benadryl as therapeutic agent in treatment of common cold. *U. S. Nav. M. Bull.* **47**:810, 1947.
40. Arminio, J. J., and Sweet, C. C. Prophylaxis and treatment of common cold with neohetramine (thonzylamine hydrochloride). *Indust. Med.* **18**:509-511, 1949.
41. Council on Pharmacy and Chemistry of the American Medical Association. Status report on antihistaminic agents in prophylaxis and treatment of common "cold." *J. A. M. A.* **142**:566-599, 1950.
42. Shaw, C. R., and Wightman, H. B. Study on treatment of common cold with antihistaminic drug. *New York State J. Med.* **50**: 1109-1111, 1950.
43. Hoagland, R. J., Deitz, E. N., Myers, P. W., and Cosand, H. C. Antihistaminic drugs for colds: evaluation based on controlled study. *J. A. M. A.* **142**:157-160, 1950.
44. Cowan, D. W., and Diehl, H. S. Antihistaminic agents and ascorbic acid in early treatment of common cold. *J. A. M. A.* **143**:421-424, 1950.
45. Lowell, F. C., Schiller, I. W., Alman, J. E., and Mountain, C. F. Antihistaminic drugs in treatment of common cold: study conducted at Boston University. *New Eng. J. Med.* **244**:132-134, 1951.
46. Personnel of the United States Naval Medical Research Unit No. 4. Prophylaxis and treatment of acute respiratory diseases with antihistaminic drugs. *J. Lab. & Clin. Med.* **36**:535-590, 1950.
47. Browning, R. H. Early treatment of common colds with antihistamine–Histadyl. *New Eng. J. Med.* **243**:994, 1950.
48. Andrewes, C. H. Common cold. *J. Roy. Inst. Pub. Health & Hyg.* **14**:199-208, 1951.
49. Long, P. H. *A-B-C's of Sulfonamide and Antibiotic Therapy.* 231 pp. Philadelphia: Saunders, 1948. P. 176.
50. Atlas, L. T., and Hottle, G. A. Common cold: titration of MR-1 virus in embryonated eggs. *Science* **108**:743-745, 1948.
51. Ward, T. G. Use of radioactive phosphorus in studies of chick embryo infections with common cold virus. *Am. J. Hyg.* **52**:107-132, 1950.
52. Dingle, J. H., et al. Study of respiratory infections in families. *Tr. A. Am. Physicians* **62**:99-104, 1949.
53. Milam, D. F., and Smillie, W. G. Bacteriological study of "colds" on isolated island (St. John, United States Virgin Islands, West Indies). *J. Exper. Med.* **53**:733-752, 1931.
54. Horsfall, F. L. In Rivers, T. M. *Viral and Ricketsial Infections of Man.* Second edition. 719 pp. Philadelphia: Lippincott, 1952. P. 381.
55. Smiley, D. F. Seasonal factors in incidence of acute respiratory infections. *Am. J. Hyg.* **6**:621-626, 1926.
56. Andrewes, C. H., Lovelock, J. E., and Sommerville, T. Experiment on transmission of colds. *Lancet* **1**:25-27, 1951.
57. Kerr, W. J., and Lagen, J. B. Studies on transmissibility of common cold: exposure of susceptible individuals under controlled conditions. *Tr. A. Am. Physicians* **49**:245-251, 1934.

MEDICAL INTELLIGENCE

SORENESS OF THE GUMS IN RUBELLA

Bruce L. Brown, M.D.*

WARREN, OHIO

"The creature of many moods" was the apt description that Graham[1] gave to rubella in 1932 when he remarked on the propensity of the disease to resemble real measles in 1 case, scarlet fever in another and both measles and scarlet fever in successive stages of the same attack. Infectious mononucleosis, which is itself a subject of "mood," deserves addition to the group of diseases with which rubella may be confounded. And since the work of Gregg[2] and others[3-8] in establishing the relation between rubella in early pregnancy and the occurrence of congenital anomalies, precise diagnosis in the pregnant woman or in the persons to whom she may have been exposed has urgent therapeutic implications. Thus, attention is called to a symptom that may be of value in diagnosis.

During the spring of 1951 I had the opportunity to observe several hundred patients with rubella while serving as a medical officer at a military hospital. A frequent complaint volunteered by these patients was that of soreness of the gums. When specifically questioned regarding this symptom approximately a third of the patients with rubella admitted its presence. A search in the standard textbooks did not disclose information on this feature of rubella, nor could refer-

*Formerly, assistant resident in medicine, University Hospitals, Cleveland, Ohio.

ence to it be found in the literature then available. The symptom usually appeared with the onset of the exanthem and continued for a day or two. Examination of the gums and teeth occasionally showed a slight gingival inflammation but more often nothing abnormal. It was with real interest, then, that I read of Kalmansohn's[9] observation of this symptom in several of 100 cases recently reported. Further search in the literature disclosed Todd's[10] description of her personal experience with rubella: "My gums were very tender and felt as though my teeth were falling out." Bennett and Copeman,[11] in a report of an epidemic in the British Expeditionary Force in 1940, gave a similar account:

> A large number of our patients complained of a complication to which we have been unable to find any reference in the books consulted. This was described by many patients as a "toothache." On further investigation, however, it appeared that it was in reality an intense aching of the gums. This lasted for forty-eight hours and was severe enough in some cases to keep the patient awake at night. It started on the second day in most cases. In certain others, however, it was a feature of the onset. It was noted by one of us that in those cases the patient's temperature was higher than is considered normal for rubella, sometimes rising to over 101°F.

Despite the many detailed descriptions of rubella in the literature that followed Maton's[12] establishment of rubella as a pathologic entity, no further reference to this symptom was found.

As suggested by Graham,[1] soreness of the gums may be a feature of only some "moods" of the disease. It has not been described by writers reporting epidemics of rubella in age groups in which accurate reporting of symptoms by the patient might have been expected. When present, the symptom has been helpful in differentiating rubella from infectious mononucleosis and rubeola. Further observations of its occurrence might profitably be made.

References

1. Graham, J. R. Rubella. *New York State J. Med.* 32:1368-1370, 1932.
2. Gregg, N. McA. Congenital cataract following German measles in mother. *Tr. Ophth. Soc. Australia* 3:35-46, 1941.
3. Fox, M. J., and Bortin, M. M. Rubella in pregnancy causing malformations in newborn. *J.A.M.A.* 130:568, 1946.
4. Aycock, W. L., and Ingalls, T. H. Maternal disease as principle in epidemiology of congenital anomalies, with review of rubella. *Am. J. M. Sc.* 212:336-379, 1946.
5. Ober, R. E., Horton, R. J. M., and Feemster, R. F. Congenital defects in year of epidemic rubella. *Am. J. Pub. Health* 37:1328-1333, 1947.
6. Gronvall, H., and Selander, P. Some virus diseases during pregnancy and their effect on fetus. *Nord. Med.* 37:409-415, 1948.
7. Hill, A. B., and Galloway, T. McL. Maternal rubella and congenital defects. *Lancet* 1:299, 1949.
8. Logan, W. P. D. Incidence of congenital malformations and their relation to virus infections during pregnancy. *Brit. M. J.* 2:641-645, 1951.
9. Kalmansohn, R. B. Rubella (German measles): observations on epidemic with particular reference to lymphadenopathy. *New Eng. J. Med.* 247:428, 1952.
10. Todd, D. M. Rubella. *Brit. M. J.* 1:718, 1940.
11. Bennett, R. A., and Copeman, W. S. C. Notes on rubella: with special reference to rheumatic sequelae. *Brit. M. J.* 1:924-926, 1940.
12. Maton, W. G. Some account of rash, liable to be mistaken for scarlatina. *M. Tr., Roy. Coll. Physicians* 5:149-165, 1815.

BY THE LONDON POST

Consultants' Salaries — Hospital Rivalry — Nursing Problems

JOHN LISTER, M.D.

LONDON, ENGLAND

ALTHOUGH the general practitioners had a considerable increase in their capitation fees last year there has not yet been any increase in the remuneration of hospital medical staff. The delay in negotiations has resulted in a gathering crescendo of protest from consultants and specialists. Furthermore, the correspondence in the medical journals has shown considerable disunity between consultants employed part time and those employed full time in the National Health Service, the total number of consultants in England and Wales being 6250, of whom 1800 have full-time contracts.

The splitting of the profession into groups with differing interests has been one of the tragedies of the service, and the matter of full-time or part-time employment is one of the fundamental principles on which opinion has been divided. Unhappily, it is on this point that political feelings run at their highest, and in certain quarters of the Socialist ranks there is an almost fantatical desire to impose a full-time salaried consultant service on the hospitals. The official reason for this wish is that it would be more economical to employ a smaller number of full-time than a larger number of part-time physicians. On the other hand the conditions of service debar a full-time consultant from engaging in private practice, and it is no secret that the most vociferous of the Socialist advocates of a full-time service would also like to see the elimination of private medical practice. The reason for this is hard to understand, and the *British Medical Journal* recalls that the majority of the medical profession has been consistently opposed to a full-time service and that physicians entered the National Health Service only on the promise that a salaried service would not be brought in by regulation. The *Journal* believes that the opposition to full-time appointments was nonpolitical and came from a conviction that such an arrangement would be bad for the public and the profession.

In submitting their evidence to the Guillebaud Committee, which is at present investigating the finances of the whole National Health Service, the representatives of the Royal College of Physicians have re-emphasized the main advantages of employing consultants on a part-time basis. They suggest that a full-time service lacks flexibility and that fundamentally the demand for part-time consultants comes from the general public, who want to preserve an

independent second opinion and the right to nominate their own consultant. It is considered that there is a place for both the full-time and the part-time specialist and that each person is likely to give of his best when he is appointed to a post suited not only to his special skill but also to his temperament.

The Minister of Health has publicly expressed his own view that a full-time service for all consultants would be disastrous. He said that consultants and specialists are not primarily full or part time; they are primarily doctors. They have the same standard of ethics toward their patients whether they are in private rooms or in wards.

Nevertheless, there are monetary and other practical advantages of those working part time that are not available to the full-time man, who is entitled to few expense concessions from the taxation officer and receives less cash payment for traveling expenses.

These matters require full consideration before all consultants and specialists will work in complete harmony, and it is hoped that the protracted negotiations on the matter of consultants' remuneration will soon reach a satisfactory conclusion.

* * *

Good-natured rivalry has always characterized the relations between the undergraduate London teaching hospitals. The Bart's man, proud of his hospital's great age and of the fact that it is the only hospital within the City mile, talks of the man from Guy's as coming from "that place across the river." The Guy's man retaliates by describing St. Bartholomew's Hospital as "that place in Smithfield Meat Market," and the London Hospital students are known as "those fellows from the Whitechapel Road."

It is in the field of sport, however, that rivalry is fiercest, and the most jealously guarded prize is the Hospitals' Rugby Football Cup. One of the strongest arguments that the all male medical schools could produce when resisting the University decree that they should admit women was that they could not play rugger. Eventually, they had to agree that they might become useful supporters for the team.

For many years St. Mary's has been the leading rugby hospital, and only once since 1934 has it failed to reach the finals of the Hospital Cup. Indeed, it has been wickedly alleged that for some it has been easier to gain entry to the Medical School at Mary's by rugger-scrum strength than by academic brilliance.

The winners of the cup last year, they met their match in St. Thomas's in the final this year. Not since 1888 had Thomas's beaten Mary's in a final, so that it was a great triumph to be able to wrest the title from the holders by a goal scored in the last five minutes of the game — but no doubt Mary's will rise again.

* * *

Shortage of nurses, the extensive use of student nurses in caring for the sick and the limitation of the duties of a nurse are all points that have recently been discussed in both the lay and the medical press.

Recruitment into the nursing profession has certainly improved, the number of student nurses in the hospitals having risen from 46,655 in 1947 to 58,270 by 1951; since then there has been a further small increase. On the other hand the wastage rate during training is high, and a Nuffield Trust survey revealed that 75 per cent of the care of patients in hospital is undertaken by student nurses. It was Florence Nightingale who thought of a nursing school as a place of education for nurses, who, by using the practice provided by the patients in hospitals, could learn the profession as quickly as possible and thereafter provide trained nursing service. This ideal has never really come to fruition, and as the need for nurses has increased and as more hospitals have been recognized as training schools, a state of competitive recruitment of one hospital against another has developed.

The hospitals associated with medical schools have naturally proved the greatest attraction, for there the young nurse may combine her search for knowledge with a search for an eligible bachelor. Indeed, the *Lancet* has pointed out that it is often the endocrine upheaval of puberty that urges the teen-ager to seek a place in a nursing school so that no wonder need be expressed if, when hormonal balance is regained, the more mature trained nurse leaves her profession for marriage. Nevertheless, a correspondent to the *Times* has hinted that another cause of wastage may be frustration during training owing to a deficiency in the quality of the clinical and theoretical experience that some nurses receive. At present the matrons of hospitals are caught in a conflict between their desire to provide the best possible care for their patients and the best possible training for nurses. He suggests that a solution might be the handing over of the responsibility for training nurses from the hospitals themselves to the departments of education. Such a move as this would be so great a break with tradition that it hardly seems likely that the Royal College of Nursing would approve. This august body, which has the training of nurses as its chief function, has been anxious that the duties of a nurse should be more clearly defined. The Council of the College has been worried about a possible confusion between the functions of nurses and doctors. There has been a tendency for nurses to carry out duties not within their field of training, such as withdrawing venous blood or giving intravenous injections. Besides exposing a nurse to charges of professional negligence, the performance of duties outside her professional scope makes inroads into the time that she should spend in the care of patients.

All these points are clearly related to "nursing manpower," and the General Nursing Council maintains that a trained nurse should have enough to do in teaching, caring for her patients and administering her department.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

BENJAMIN CASTLEMAN, M.D., *Editor*

VIRGINIA W. TOWNE, *Assistant Editor*

CASE 40171

PRESENTATION OF CASE

A twenty-nine-year-old married bartender was admitted to the hospital because of congestive heart failure.

About one and a half months previously fever (temperature of 105°F.), chills, cough productive of yellow sputum and generalized aching had suddenly begun. In the next week he had headache, epistaxis, shoulder pain and sore throat. He was treated with chlortetracycline by his physician and the symptoms subsided in ten days. On the eleventh day he began to have dyspnea, orthopnea, paroxysmal nocturnal dyspnea and ankle edema. He was sent to another hospital and was given a low-salt diet, digitoxin, oxygen and mercurial injections. A heart murmur was heard at that time. During the three weeks in the hospital he responded poorly to treatment, and he had been sleeping in a chair since discharge. He was admitted to this hospital two weeks later.

He had been a heavy drinker and had an indefinite history of hypertension.

Physical examination revealed an obese, pale man who sat upright in bed with marked dyspnea. The neck veins were pulsating at 90° although they were not prominent because of the obesity. Expansion of the chest was decreased; it was believed that fluid was present in the right pleural cavity, but no rales were heard. The heart was enlarged, and the heart sounds were weak. There was a gallop rhythm, and systolic and diastolic murmurs were audible in the fourth intercostal space at the left sternal border. The pulmonic second sound was accentuated. The liver edge was felt 5 fingerbreadths below the right costal margin and was slightly tender. The spleen was not palpable. There was +++ to ++++ pitting edema of both lower extremities.

The temperature was 99°F., the pulse 105, and the respirations 30. The blood pressure was 140 systolic, 75 diastolic.

The urine had a specific gravity of 1.016 and gave a ++ test for albumin; the sediment contained rare red cells and granular and hyaline casts. Examination of the blood disclosed a hemoglobin of 10.3 gm. per 100 cc., and a white-cell count of 9200, with 65 per cent neutrophils, 26 per cent lymphocytes, 1 per cent monocytes and 3 per cent eosinophils. The sedimentation rate was 40 mm. in one hour. The fasting blood sugar was 122 mg., the nonprotein nitrogen 72 mg., the bilirubin 1 mg., and the total protein 6.4 mg. per 100 cc., with an albumin-globulin ratio 1.2; the sodium was 131 milliequiv., the chloride 101 milliequiv., the carbon dioxide 23 milliequiv., and the potassium 6 milliequiv. per liter. The blood pH was 7.34. A throat culture grew out *Neisseria catarrhalis*, alpha-hemolytic streptococci, *Haemophilus influenzae* and *Staphylococcus albus*. The antistreptolysin titer

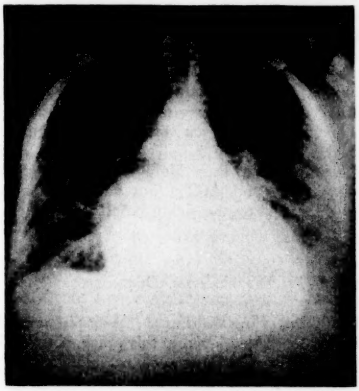


FIGURE 1.

was less than 50. An electrocardiogram revealed a sinus tachycardia at a rate of 105, and a PR interval of 0.17 second and a QRS interval of 0.09 second; all complexes in Lead 1 were of low voltage, and there was a tendency to low voltage in all limb leads, with depressed ST segments in Leads 1, 2, 3, aVF, V_5 and V_6. The QRS segment showed a transition zone in Lead V_5; the T waves were low and upright in Leads 1, 2, 3, aVF and aVL and upright in Leads V_1 through V_6. A roentgenogram of the chest showed generalized cardiac enlargement (Fig. 1), with a cardiothoracic ratio of 18:31 cm. There was engorgement of vascular structures at the lung roots and to a moderate degree peripherally; no fluid was seen.

The patient was treated with 500 mg. of sodium and a 1000-calorie diet and morphine. The urinary output was about 500 cc. a day, but after the intravenous administration of glucose, it was 3650 cc. on

the third hospital day and 1400 cc. on the fifth day. However, the nonprotein nitrogen steadily increased although the findings on urinalysis remained about the same. One flask of three two-flask blood cultures taken at two-hour intervals on the fourth hospital day grew out *Staph. albus;* the others showed no growth. The patient remained afebrile and continued to improve slightly. Aspirin was prescribed. The heart rate was regular and reduced to about 75, with less gallop quality, and the leg edema decreased. On the sixth day, a temperature of 100°F. developed. The blood pressure was 122 systolic, 50 diastolic. The cardiac murmurs were less intense, and the heart rate was 92 with regular rhythm. Crysticillin was started the next day, and the temperature fell to 98.5°F. in the evening. At the same time the patient was noted to be sweating profusely and markedly dyspneic, with a respiratory rate of 38 per minute; the cardiac rhythm was irregular at a rate of 100 per minute. An electrocardiogram demonstrated reduction in voltage in the limb leads, with high-peaked T waves suggestive of hyperkalemia. The blood counts and urinalysis were about the same. The next day, the patient appeared cyanotic, but refused to stay in an oxygen tent. The heart sounds were of much poorer quality. The nonprotein nitrogen was 118 mg. per 100 cc., and the potassium 7.5 milliequiv. and the sodium 128 milliequiv. per liter. He was given Mercuhydrin, aminophylline and ACTH intramuscularly without effect. He died on the eighth hospital day.

Differential Diagnosis

Dr. Thomas A. Warthin*: A respiratory infection apparently developed in this young, obese, mildly hypertensive bartender six weeks before admission. On the eleventh day of this illness there was a sudden change in symptoms, associated with the rapid appearance of orthopnea, paroxysmal nocturnal dyspnea and ankle edema. He did not respond to treatment and died four weeks later. I have to consider, of course, the disorders peculiar to his trade and those accompanying hypertension, but most particularly the problems associated with acute congestive heart failure or acute increase of circulating blood volume. I think Dr. Hanelin can help me with the x-ray films.

Dr. Joseph Hanelin: The chest films show a greatly enlarged heart of nondescript configuration (Fig. 1). There is evidence of vascular engorgement in the lungs and of some pulmonary edema but no indication of pleural effusion.

Dr. Warthin: Is there anything to suggest a pericardial effusion?

Dr. Hanelin: It is possible that a pericardial effusion is present, as far as the cardiac configuration is concerned; however, the enlargement of the silhouette is not to the degree that may be found with massive effusions.

Dr. Warthin: Was there any widening at the base to suggest a dissecting aneurysm?

Dr. Hanelin: No; I do not see any evidence of aneurysm.

Dr. Warthin: The discussion should begin with the patient's occupation. Poisoning in bartenders is likely to take two forms. In the first place, can I hoist him with his own petard—namely, the effects of alcohol or beriberi heart disease? It should be remembered that beriberi heart disease burns only in the flame of some other cardiac disorder. This patient was an alcoholic and had some physical signs consistent with high-output cardiac failure, such as a gallop rhythm, distention of the neck veins and general edema. There was no evidence of a neurologic disturbance that affected the extremities, nor do we know the circulation time. Of course, any condition that is treatable ought to receive first consideration in one's approach to a patient, and beriberi heart disease is a treatable cardiac disorder. The interesting diuresis after he had received glucose intravenously probably would not occur in somebody whose pyruvate metabolism was grossly disordered. I shall therefore exclude beriberi heart disease.

The other form of poisoning that one sees in bartenders is associated with their frequent use of carbon tetrachloride, which they are very likely to employ in removing barnacles from the ale spigots. Is there anything about this patient that could be attributed to a lower-nephron nephrosis of unrecognized type? The urinary and chemical findings were compatible with it, but I think the duration of the disease rules this out without much doubt.

The patient was allegedly hypertensive. Could he have had more hypertension than had been noted in the past—that is, pure hypertensive cardiovascular disease with failure, which is sometimes very striking and might have been precipitated by an infection? I do not believe that is likely on the basis of the blood pressure obtained here nor the type of cardiac involvement—the heart would have been larger. The lack of changes in eye grounds or other peripheral vessels is likewise against that diagnosis. He did not have evidence of a dissecting aneurysm, which we must always consider as an explanation for a rapidly fatal course in a young person, particularly when he has a history of hypertension.

Could he have had an acute glomerulonephritis? He had an initial infection, which seemed to be due to an organism sensitive to chlortetracycline, and after a latent period dyspnea, orthopnea, paroxysmal nocturnal dyspnea and ankle edema suddenly developed. No mention was made of the appearance or volume of the urine at the time, and that is a crucial point in determining whether this was a possibility. If he had definite oliguria and smoky urine, one could seriously consider this as explaining the whole illness. He did

*Assistant physician, Massachusetts General Hospital; chief, Veterans Administration Hospital, West Roxbury, Massachusetts.

not have this history, however, and by the time he arrived in the hospital the urine showed only rare red cells and rare casts so that evidence of continued glomerulonephritis is lacking. Dr. Hanelin, was there anything in the x-ray film of the chest to suggest a nephritic type of pulmonary edema rather than the ordinary cardiac type?

DR. HANELIN: This is not the classic picture of nephritic edema; it is more in keeping with congestive heart failure.

DR. WARTHIN: This certainly is still a possibility and would explain the continued renal failure that was present terminally. Could he have had an acute polyarteritis nodosa? Two systems appear to have been involved, the cardiac and the renal, but I shall rule polyarteritis nodosa out because only these two systems were involved.

Could he have had an acute idiopathic or tuberculous pericarditis with effusion? In the idiopathic type the patients rarely die so I think we can discard that possibility. Tuberculosis should be considered more seriously since he was an alcoholic. We did not see anything in the x-ray film of the chest to suggest a pulmonary source for tuberculous pericarditis. The symptoms were those of cardiac failure rather than of falling cardiac output. The pulse pressure increased rather than decreased in extent. On the basis of the pulse pressure I shall discard a pericardial effusion as being significant in his death.

Rheumatic fever is a possibility. There were cardiac murmurs strongly suggestive of rheumatic valvular disease and then an infection and a short latent period. I think the clinical history is in keeping with the development of acute rheumatic fever. A rheumatic pericarditis could well explain the course and death. However, there were no confirmatory joint symptoms for this disorder, and the patient did not respond to the ACTH administered later in the hospital course.

Could he have had some other sort of myocarditis? Nothing in the electrocardiogram specifically pointed in that direction. Could he have had another type of diffuse myocarditis, of which fibroelastosis is currently the favorite? Patients with fibroelastosis will on rare occasions run as acute a course as this. Those with the other types, Fiedler's myocarditis and so forth, are a little more likely to die as quickly as the patient under discussion did. None of the myocarditides alone, however, explain the degree of potassium retention that developed. I am going to place a great deal of stress on the final serum potassium of 7.5 milliequiv. per liter. Congestive heart failure may result in a nonprotein nitrogen retention of 112 mg. per 100 cc. — I have seen levels higher than that — but will not produce such a high serum potassium. Therefore, I must assume that he had some important renal disorder in addition to congestive heart failure.

The final possibility, an infectious process associated with valvular heart disease and occasionally terminating in renal failure, is subacute bacterial endocarditis. The original respiratory infection may have been the portal of entry of the organisms producing a subacute bacterial endocarditis for which the brief course of chlortetracycline was not adequate treatment. The disease then entered an abacterial phase. However, sufficient valvular damage had taken place for acute cardiac failure to develop. Characteristically, such patients with subacute bacterial endocarditis, when they go into failure, do it very rapidly, as this man did. The entire course in the hospital, with the lack of response to the ordinary treatment of congestive heart failure, is not out of keeping with this concept. The development of a renal lesion, in the days before antibiotics, occurred during the so-called bacteria-free stage of subacute bacterial endocarditis. The fact that he had received some therapy is in keeping with the development of such a stage. I am not surprised, therefore, that the blood cultures were negative. Subacute bacterial endocarditis, again, is a treatable condition, and I should have considered it the most likely diagnosis on admission and would have treated him vigorously with this in mind.

In summary I believe that this bartender had subacute bacterial endocarditis superimposed on a rheumatic aortic valve and that the glomerulonephritis that we frequently see in endocarditis developed.

A PHYSICIAN: The spleen was not palpable; does that disturb you at all?

DR. WARTHIN: It would be helpful if it had been palpable, but one must remember that the patient was in the bacteria-free stage during which, by and large, there is no embolization so that I am not too disturbed by the apparent smallness of the spleen.

DR. BENJAMIN CASTLEMAN: The enlargement of the spleen in subacute bacterial endocarditis is often due not to embolization but to chronic sepsis.

DR. EARLE M. CHAPMAN: Our line of reasoning was much the same as Dr. Warthin's. On the night of entry, Dr. Zanvil A. Cohn and I were impressed with the history of hypertension and a very loud, blowing, aortic diastolic murmur. That night Dr. Cohn's note read, "Could he have ruptured an aortic valve?" I thought this was a good possibility. However, I also raised the question of Fiedler's myocarditis. He was on bed rest in the hospital but was not given specific treatment. I withheld mercurial diuretics at first because I thought that he might not do well with them. ACTH was considered but was not given; Mercuhydrin was given on the morning of the day he died, but there was no response to it — in fact the kidneys shut down after it. It is interesting that when he received glucose, he had a voluminous diuresis. Years ago intravenous administration of glucose was given as a diuretic in some patients with cardiac disease, but the response was so vari-

able that it is hardly ever used now. It certainly was effective in producing a diuresis in this patient.

DR. ALFRED KRANES: I saw this patient only once on teaching rounds shortly after he was admitted to the hospital. Our opinion at that time was that the most likely diagnosis lay between acute rheumatic fever and bacterial endocarditis, the former being somewhat more likely.

DR. GORDON S. MYERS: I should like to ask if Dr. Warthin considered the possibility of a congenital bicuspid aortic valve with a superimposed bacterial endocarditis. We have seen a number of patients with the bicuspid valve and bacterial endocarditis in whom loud aortic murmurs and congestive heart failure have suddenly developed.

DR. WARTHIN: I think it is a good possibility.

DR. FARAHE MALOOF: There is some information that I got from the patient's family that I do not think is in the record — at the age of three he had convulsions, and the family physician apparently heard a heart murmur.

DR. WARTHIN: I am glad it was not in the record.

CLINICAL DIAGNOSES

Acute myocarditis.
Acute rheumatic fever.
Acute nephritis.
?Septicemia.
Obesity.
Hypertension.

DR. THOMAS A. WARTHIN'S DIAGNOSES

Subacute bacterial endocarditis, with aortic regurgitation.
Glomerulonephritis.

ANATOMICAL DIAGNOSES

Acute bacterial endocarditis, aortic valve, with mycotic aneurysm of sinus of Valsalva.
Chronic passive congestion of lungs and liver, severe.
Glomerulonephritis, acute, diffuse, proliferative, mild.
Hydrothorax, right; ascites; hydropericardium.

PATHOLOGICAL DISCUSSION

DR. CASTLEMAN: This man weighed 250 pounds and, although obese, was a big, strapping fellow. The autopsy gave evidence of heart failure, with fluid almost everywhere. The heart was large, weighing 540 gm., but a man of this size might well have a heart of 450 gm. normally so that it was not a huge heart; it weighed possibly 50 to 100 gm. more than the normal heart. Perhaps the heart shadow seen in the films was produced by dilatation as well as by mild hypertrophy; the trabeculae carneae of the left ventricle were flat — evidence of cardiac dilatation and aortic regurgitation. The aorta was perfectly smooth, and the coronary arteries were normal. The cusp of the right posterior aortic valve was normal; the commissure between the anterior and left posterior cusps was destroyed, and these two cusps close to the commissure were both perforated. This destructive process resulted from an obvious bacterial endocarditis. It would be hard to be sure, merely from examination of this area, whether there had been underlying valvular disease, but the fact that one cusp and the mitral valve were perfectly normal is good evidence for the absence of previous rheumatic infection and for the presence of an acute bacterial endocarditis on a previously normal valve. Behind these cusps was a mycotic aneurysm of the sinus of Valsalva that extended into the myocardium, forming a real abscess (Fig. 2). Organisms were still present on microscopical examination of this cusp, although culture of the heart's blood was negative. There were emboli to the myocardium itself, with the production of small miliary infarctions that might also have been a factor in the dilatation of the heart. It is quite possible that previous hypertension accounted for the slight enlargement of the heart; there were, however, no vascular changes in the kidney.

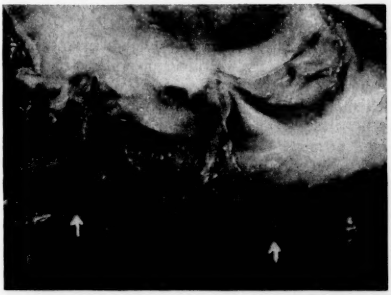


FIGURE 2. *Photograph of the Aortic Valve.*
White arrows point to bacterial endocarditis on the ruptured cusps, which have been pulled back to disclose the mycotic aneurysm of the sinuses of Valsalva (A). *The black arrow points to the destroyed commissure between the anterior and left posterior cusps.*

DR. WARTHIN: Did the organisms look like pneumococci?

DR. CASTLEMAN: They looked like streptococci. The kidneys showed a mild glomerulitis. Certainly, in examining the kidneys one would never have believed that the nonprotein nitrogen was so high. It is quite possible that some of the nitrogen retention was due to the heart failure. The spleen was large;

it weighed 625 gm. and showed the inflammatory changes usually seen in bacterial endocarditis.

DR. WARTHIN: Is it possible that the cavity pointed out was a congenital defect in the area of the Valsalva sinus rather than an abscess cavity as you interpreted it?

DR. CASTLEMAN: The differentiation of congenital and acquired aneurysm is often difficult, especially when a bacterial endocarditis is present; however, the congenital ones are usually smaller and often bulge into the right ventricle. In this case the aneurysmal dilatation was diffuse; it involved the left coronary sinus, and there was severe damage of the myocardium. All these favored an acquired origin of the defect rather than a congenital. Since the infected aortic cusps were ruptured it was also difficult to decide whether the aortic valve was bicuspid or tricuspid; however, the equal distances between the three commissures of the cusps, the definite remnants of commissure above the ruptured portion of the cusps and the normal right posterior cusp favor the tricuspid nature of the valve. Jones and Langley* reviewed 25 congenital aneurysms of the aortic sinuses; none involved the left coronary sinus as this one did, and bacterial endocarditis was found to be the cause of 4 of 22 acquired aneurysms.

A PHYSICIAN: How much fluid was present?

DR. CASTLEMAN: There was 500 cc. in the abdomen and 800 cc. in the right pleural cavity; the left did not have any, and there was 150 cc. in the pericardium, which is more than normal but not enough to produce an enlarged cardiac shadow on the roentgenogram.

*Jones, A. M., and Langley, F. A. Aortic sinus aneurysms. *Brit. Heart J.* 11:325-341, 1949.

CASE 40172

PRESENTATION OF CASE

First admission. A forty-seven-year-old housewife was admitted to the hospital for surgical removal of a pelvic mass.

Nodular masses in the uterus had been interpreted by the referring physician eight years earlier as leiomyomas. During the past few years the patient had had menstrual irregularities and occasional intermenstrual discharges. On a more recent examination the uterine mass was noted to be somewhat larger, and an operation was recommended.

The patient had had two pregnancies, with one living child. Eleven years before admission, a right oöphorectomy and partial left oöphorectomy had been performed. Later, recurrent breast cysts developed requiring tapping to relieve painful distention. The family history revealed that a paternal aunt had died with carcinoma of the breast; the patient's father had died of carcinoma of the rectum, and an uncle of Hodgkin's disease.

On physical examination the lungs were clear, and the heart was not enlarged. Both breasts were lumpy. A mass was palpable in the pelvis.

The temperature, pulse and respirations were normal. The blood pressure was 170 systolic, 90 diastolic.

Routine laboratory studies were negative.

On the second hospital day, the uterus, tubes and remaining left ovary and appendix were removed. The pathological diagnoses were endometriosis of the uterus and ovary, leiomyomas of the uterus and carcinoid and endometriosis of the appendix. The postoperative course was uneventful, and the patient was discharged on the fifteenth day.

Second admission (four years later). After discharge she experienced severe menopausal symptoms. At about the same time lumps in the left breast that subsided and recurred three or four times a year also developed. These were treated with "hormones" and aspirations. About nine months before admission the left breast became asymptomatic; however, three months later she noted an egg-sized mass in the right breast. This was not tender and did not change in size. Lumps also appeared in the axilla on the right.

On physical examination there were no changes except for the presence of a firm, nontender, easily movable mass in the upper outer quadrant of the right breast. The right axillary lymph nodes were enlarged.

Laboratory studies were negative.

A right radical mastectomy was performed. The pathological report was "adenocarcinoma, Grade 3, with metastases to regional lymph nodes; the three highest nodes are negative." The patient was discharged two weeks later.

Third admission (six years later). Three years after the radical mastectomy she underwent a left simple mastectomy, with a pathological diagnosis of mastitis. A year later she began to cough and wheeze; the symptoms were relieved by drugs, and a diagnosis of bronchial asthma was made. X-ray films of the chest showed normal pulmonary parenchyma, heart shadow and bones; no abnormal masses or lymph nodes were seen (Fig. 1). A bronchogram was interpreted as negative except for incomplete demonstration of the right-lower-lobe bronchi. Bronchoscopic examination was entirely negative. The symptoms almost disappeared two years before admission but recurred with greater severity during the year before admission. A dry, rasping, hacking cough that was persistent and occasionally productive of blood-streaked sputum developed; it occasionally awoke her at night and was quite discomforting. A week before admission she had a frank hemoptysis of a small quantity of bright-red blood. She was admitted to the hospital for study.

Physical examination revealed a well developed, well nourished woman who had spasms of harsh coughing with deep breathing. The neck veins were flat, and the trachea deviated slightly to the right. The chest showed less expansion on the right than on the left, with decreased tactile fremitus, decreased to

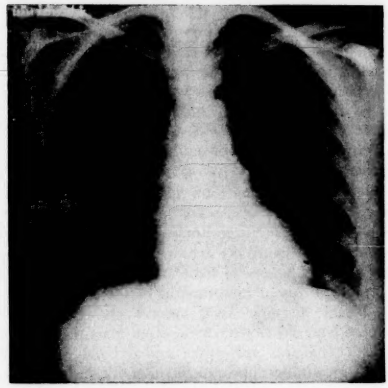


FIGURE 1.

absent breath sounds and dullness over the lower two thirds of the right side of the chest anteriorly and posteriorly.

The temperature was 98.6°F., the pulse 76, and the respirations 20. The blood pressure was 160 systolic, 100 diastolic.

Routine laboratory studies were negative. Chest roentgenograms brought from another hospital showed a mass in the right hilus measuring approximately 3.5 cm. in diameter (Fig. 2). The right lower lobe was collapsed, and the right leaf of the diaphragm was elevated. No bony defects were seen.

On the second hospital day bronchoscopy was performed.

DIFFERENTIAL DIAGNOSIS

DR. JOSEPH W. GARDELLA*: May I see the x-ray films?

DR. JOHN F. GIBBONS: The first chest films made at another hospital four years before the third admission show no significant abnormal findings, except that the shadow of the right breast is absent (Fig. 1). A bronchogram is normal although there is incomplete filling of the right-lower-lobe bronchi. Films of the chest taken four years later at another hospital show complete collapse of the right lower lobe, with an abnormal prominence of the right hilar shadow (Fig. 2). There is no evidence of metastasis in the bony thorax, and the left lung is clear.

DR. GARDELLA: In summary this fifty-seven-year-old woman, at the age of thirty-six, had a partial oöphorectomy for an unstated reason. Subsequently bilateral breast cysts and menstrual irregularities developed. During the next eleven years uterine leiomyomas, and endometriosis developed, and she was operated on at the age of forty-seven. Four years later a radical mastectomy was performed. Adenocarcinoma with regional metastases was reported. Two years later, at the age of fifty-three, she began to cough and wheeze. Although bronchial studies were interpreted as negative these symptoms persisted and within three years classic signs of complete bronchial obstruction and a right hilar mass developed. At the age of fifty-seven she was admitted for study of pulmonary symptoms of four years' duration.

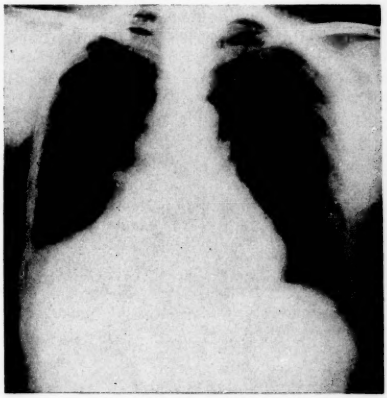


FIGURE 2.

The etiology of the pulmonary disease appears to be the chief problem in diagnosis in this case and one immediately wonders what relation, if any, existed between the disease in the chest and the previous illnesses. Metastatic cancer of the breast may well have been responsible for the pulmonary disorder, but none of the abdominal diseases are likely to have been allied to the chest lesion. It is interesting, however, that breast cysts, uterine leiomyomas and endometriosis should have developed after partial oöphorectomy. These lesions appear to be related in some way to what is popularly called sex-hormone imbalance. Menstrual irregularities and intermenstrual discharge are also attributed to this esoteric mechanism. The next effect of these considerations in this case

*Clinical and research fellow in medicine, Massachusetts General Hospital.

suggests that the ovarian function was a bit chaotic. The chances are that the disorder was physiologic rather than pathologic, but one might consider a granulosa-cell tumor and even the possibility of pulmonary metastases from this disease. The severe menopausal symptoms after complete ovariectomy constitute evidence against the existence of functioning metastatic ovarian tissue. Granulosa-cell tumors, moreover, rarely do more than invade locally, and to postulate pulmonary metastases from this disease is more of an academic sport than a statistical probability.

About four years after the second abdominal operation cancer was added to what appears to have been simple cystic disease of the breast. I am not qualified to discuss the relation between chronic cystic mastitis or cystic hyperplasia and breast cancer, but I gather that most authorities are of the opinion that simple cysts rarely if ever become malignant, whereas cystic disease associated with marked intraductile hyperplasia and papillomas is at least potentially malignant. In any event two years after radical mastectomy this patient began to cough and wheeze. X-ray examination of the chest and bronchoscopic study at this time were interpreted as negative, but bronchograms, although reported as normal, failed to demonstrate the right lower bronchus. Complete obstruction of this bronchus ultimately developed, however, so it appears that the initial symptoms were due to an undetected bronchial lesion and that there was pulmonary disease of four years' duration. If this is true the possibility of primary bronchogenic carcinoma is not too great. Although there is no guide to the absolute duration of this disease symptoms usually are present on the average of seven months before diagnosis. In this case almost four years intervened. Furthermore, the absence of constitutional symptoms and weight loss seems no less inconsistent with this diagnosis. Although her age, the pulmonary symptoms and especially the x-ray picture are quite compatible, the long duration of symptoms and the absence of physical deterioration militate so strongly against the possibility of primary bronchogenic carcinoma that I am willing to dismiss it.

There is little to suggest an infectious process in this case. Nevertheless, invasion of the wall of the right bronchus by tuberculosis or some other granulomatous process from the contiguous hilar lymph node is a reasonable possibility. The one-year remission of pulmonary symptoms is, I believe, more likely with an infectious than with a neoplastic process, but the complete absence of evidence for infection almost precludes further consideration of such a possibility.

Bronchial adenoma seems to me to be the most logical cause of the pulmonary symptoms. It is most consistent with the four-year history since it is not uncommon for this lesion to underlie respiratory symptoms of several years' standing. Furthermore, the absence of constitutional symptoms and weight loss is to be expected in this disease. Except for the relatively small amount of sputum the symptoms and findings are classic—indeed, not all cases of bronchial adenoma produce abundant sputum. The patient, however, was a little old for this disease, and the x-ray appearance of the hilar lymph nodes, although not entirely inconsistent with bronchial adenoma, is suggestive of a more malignant process. These are rather weak objections to the diagnosis, and I might as well state now that I cannot exclude adenoma of the bronchus.

In fact I should be quite happy with this diagnosis if we were not dealing with a patient known to be harboring metastatic disease of the breast for at least six years. From previous experience, especially at these exercises, I have learned to respect the potentialities of metastatic breast disease to disobey the rules of neoplastic disease, to produce bizarre symptoms of long duration or to exist without provoking much constitutional reaction even when widespread. Therefore, I do not believe that the duration of the pulmonary disease and the surprisingly good state of health are serious objections to this possibility.

What, then, is the probability of bronchial obstruction secondary to metastatic disease of the breast? Certainly, it is less rare than is generally appreciated. In 1943 King and Castleman* reported 20 cases of bronchial invasion by a variety of metastatic tumors, of which cancer of the breast was most common. In this paper two types of bronchial invasion were described: direct extension from parenchymal or mediastinal tumor and direct metastasis to the bronchial mucosa. If bronchial involvement with metastatic breast disease was present in this case invasion from mediastinal lymph nodes rather than direct metastasis to the bronchial mucosa appears more likely. Direct metastasis would be apt, I think, to have a more rapid, inexorable progress. On the other hand, it is conceivable that a small hilar metastasis producing partial bronchostenosis escaped detection at the initial bronchial studies and slowly increased to a large hilar mass invading and ultimately obstructing the right lower bronchus. In the final analysis, however, I am unable to distinguish with certainty between an adenoma and secondary tumor of the bronchus. Two features of this case influence me in particular toward metastatic disease: the large hilar nodes, which are unusual for bronchial adenoma, and the suspicion that distant metastasis from the breast had probably occurred in the six years since radical mastectomy. The long duration without wasting favors adenoma but is not entirely inconsistent with metastatic cancer.

Mediastinal lymphoma is the only other possibility that I find attractive. This diagnosis, however, would be nothing more than a guess. By tradition one always considers a foreign body when encountering bronchial obstruction. The hilar adenopathy would then be consistent only with infection, for which there was no evidence.

*King, D. S., and Castleman, B. Bronchial involvement in metastatic pulmonary malignancy. *J. Thoracic Surg.* 12:305-315, 1943.

My diagnoses are metastatic cancer of the breast involving the mediastinal lymph nodes and right main bronchus, bronchial obstruction, complete, and atelectasis, right lower lobe.

DR. ALFRED KRANES: The various diseases that may have caused obstruction in this patient's right-lower-lobe bronchus have been well discussed by Dr. Gardella. Actually, the only two to which we gave serious consideration were primary bronchogenic carcinoma and metastatic carcinoma from the breast. The four-year history of cough and her excellent constitutional state could be used as arguments against both and need not sway one in either direction. Since she had been known to harbor metastatic axillary lymph nodes six years before, it seemed statistically more probable that the obstructing bronchial lesion was due to metastatic disease. In any event bronchoscopic examination was necessary, and that was done shortly after admission.

CLINICAL DIAGNOSES

?Metastatic carcinoma of right lung from breast.
?Primary carcinoma of right lung.

DR. JOSEPH W. GARDELLA'S DIAGNOSES

Metastatic cancer from breast involving mediastinal lymph nodes and right main bronchus.
Bronchial obstruction, complete.
Atelectasis, right lower lobe.

ANATOMICAL DIAGNOSIS

Metastatic adenocarcinoma of bronchus, with obstruction from carcinoma of breast removed six years before.

PATHOLOGICAL DISCUSSION

DR. EDWARD B. BENEDICT: Bronchoscopic study revealed a narrow, partially fixed right-upper-lobe orifice, as if from extrinsic pressure, and complete obstruction of the intermediate bronchus about 1 cm. below the orifice of the right upper lobe. The obstruction appeared to be due to a bleeding tumor mass above the level of the middle-lobe bronchus. There was also widening and partial fixation of the carina and evidence of extrinsic pressure on the lower end of the trachea. The findings were thought to be due to malignant tumor, most likely carcinoma, and the obstruction was certainly inoperable because of involvement of the trachea and right-upper-lobe bronchus by extrinsic pressure and because of the wide, fixed carina, indicating mediastinal spread of tumor. Biopsies were obtained from the tumor mass in the right intermediate bronchus. We concluded that the tumor was either metastatic from the breast or a new primary bronchogenic carcinoma—we could not tell which.

DR. BENJAMIN CASTLEMAN: The bronchoscopic biopsy confirmed Dr. Gardella's diagnosis of metastatic adenocarcinoma, which had an appearance similar to that of the original tumor of the breast.

Dr. Ira T. Nathanson then saw the patient and believed that x-ray therapy was indicated, reserving steroid therapy for any manifestations that might later arise.

Dr. Schulz, will you tell us about the therapy?

DR. MILFORD D. SCHULZ: It seemed to us that this was the only site of disease that was likely to bother the patient for some time so we thought we should like to deliver a somewhat larger dose to the tumor than we ordinarily give for palliation in the hope of keeping the disease in hand if it should regress at all. Accordingly, a soft-tissue dose in excess of 3000 r was given over a period of a month. This was done as a supravoltage technic, with the idea of letting the patient be as comfortable during treatment as possible. She tolerated the treatment very well, and the mass showed a most remarkable response as can be seen in this roentgenogram (Fig. 3). The lymph nodes had almost completely disappeared, and the pressure on the bronchus was relieved sufficiently so that the lung parenchyma was well aerated. Two months later the patient reported that her cough was much less severe.

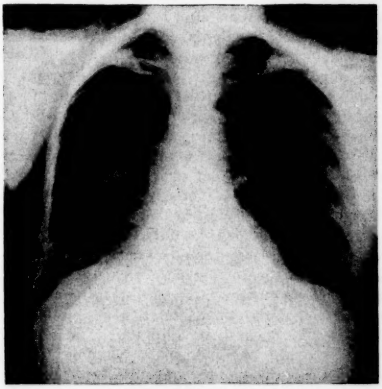


FIGURE 3.

The New England
Journal of Medicine

Official Organ of
THE MASSACHUSETTS MEDICAL SOCIETY
and
THE NEW HAMPSHIRE MEDICAL SOCIETY

OWNED BY THE MASSACHUSETTS MEDICAL SOCIETY AND PUBLISHED WEEKLY UNDER THE JURISDICTION OF THE COMMITTEE ON PUBLICATIONS

Richard M. Smith, M.D., *Chairman*
James P. O'Hare, M.D. Conrad Wesselhoeft, M.D.
Oliver Cope, M.D. Richard E. Alt, M.D.

Joseph Garland, M.D., EDITOR

ASSOCIATE EDITORS
Thomas H. Lanman, M.D. Donald Munro, M.D.
Theodore H. Ingalls, M.D.

Clara D. Davies, EXECUTIVE EDITOR
Robert O'Leary, ASSISTANT EDITOR
James F. Ballard, BOOK REVIEW EDITOR
Milton C. Paige, Jr., BUSINESS MANAGER

EDITORIAL BOARD
Henry R. Viets, M.D. Benjamin Castleman, M.D.
Robert M. Green, M.D. Hugh R. Leavell, M.D.
Dwight O'Hara, M.D. J. Englebert Dunphy, M.D.
Fletcher H. Colby, M.D. Robert W. Buck, M.D.
Robert L. Goodale, M.D. Herrman L. Blumgart, M.D.
Chester M. Jones, M.D. Frank N. Allan, M.D.
Harvey R. Morrison, M.D. Harvey A. Kelly, M.D.
Maxwell Finland, M.D. Langdon Parsons, M.D.
Vernon P. Williams, M.D. Deering G. Smith, M.D.*
*Representing the New Hampshire Medical Society.

SUBSCRIPTION TERMS: $8.00 per year in advance, postage paid, for the United States (first-year interns and medical students, $5.00 per year); Canada, $9.00 per year (Boston funds); foreign, $10.50 per year. Long-term rates: United States, 2 years $15.00, 3 years $22.00; Canada, 2 years $17.00, 3 years $25.00; foreign, 2 years $20.00, 3 years $29.50.

MICROFILM volumes available to regular subscribers through University Microfilms, 313 N. First Street, Ann Arbor, Michigan.

MATERIAL, other than original articles, should be received not later than noon on Thursday, three weeks before date of publication.

THE JOURNAL does not hold itself responsible for statements made by any contributor.

COMMUNICATIONS should be addressed to the *New England Journal of Medicine*, 8 Fenway, Boston 15, Massachusetts. Telephone KE 6-2094.

THE ANNUAL MEETING

ELSEWHERE in this issue of the *Journal* the program of the one hundred and seventy-third annual meeting of the Massachusetts Medical Society is prominently displayed. As has been the custom for the last hundred years or so a general pattern will be followed, albeit with certain innovations to keep this historic convocation abreast of the times. Thus, whereas neither Jacob Bigelow nor John Collins Warren was soothed by motion pictures or stimulated by televised ward rounds a century ago, the thousands who are destined to attend this year's meeting will be regaled with both.

As usual the supervising censors and the Council will anticipate the starting gun by gathering at the Hotel Statler on Monday, May 17, in the afternoon and evening respectively. On the following morning, when the Big Show gets really underway, a motion picture on arterial grafting will be followed by a panel discussion on reconstructive surgery of the arteries.

The official annual meeting of the Society will take place on Tuesday afternoon, according to immemorial or nearly immemorial custom. The usual awards will be presented to a new trio of medical students—one from each of the three Massachusetts schools—"for exemplifying the intangible qualities that mark the good physician." Pins will be presented to those members who, having exemplified these qualities as fellows of the Massachusetts Medical Society for fifty years, can be said to have graduated *cum laude;* the President will deliver his "state of the union" message, and Dr. Basil E. Barton, of Norfolk, will deliver the annual discourse on "The Appreciation of Medical Politicians."

The Wednesday morning panel on management of the sick child will follow the now routine motion picture, this time on congenital hypertrophic pyloric stenosis. After a coffee hour, instituted at these meetings as a brand-new tradition, although ubiquitous elsewhere, the Shattuck Lecture will be delivered by Dr. James M. Faulkner, dean of Boston University School of Medicine, on "Medical Education and the Physician." The third general session will take place in the afternoon and the annual dinner in the evening, at which time the usual host of eager gastronomers will be addressed by Dr. Edward J. McCormick, president of the American Medical Association, and Dr. Charles S. Houston, of Exeter, New Hampshire, who will speak on "Adventures of a Medical Mountaineer." The following morning will be devoted to a televised program from the Massachusetts General Hospital, and the afternoon to the last general session and the final panel, on epilepsy.

The Woman's Auxiliary will meanwhile assemble its own cohorts, with an annual meeting on Tuesday morning at the Hotel Vendome followed by a luncheon at which the Most Reverend John J. Wright, D.D., Bishop of Worcester, will speak, and Mrs. Robert T. Flanders, first vice-president of the Woman's Auxiliary to the American Medical Association, will be the honored guest.

A sherry party will be held that afternoon at Society Headquarters, 22 The Fenway, with the Norfolk District Auxiliary as hostess. The following morning the party will leave by bus for the Adams Mansion in Quincy, progressing to the Hobomock Inn in Pembroke for lunch, where Mrs. Leon J. Schaffer, of Salina, Kansas, president of the national auxiliary, and Mrs. Flanders will be the honored guests. The evening's entertainment will be shared with the members of the Massachusetts Medical Society at the annual dinner.

As in previous years, other organizations have planned their meetings to coincide with the main event: the Boston Medical Library, the Massachusetts Medico-Legal Society, the Massachusetts School Physicians' Association, and the Northern New England Branch of the American Medical Women's Association. The exhibition of works of art of the Mas-

sachusetts Physicians Art Society will be open throughout the meetings, and the annual golf tournament will take place on Wednesday afternoon at the Wollaston Golf Club.

NEW ADVERTISING POLICY

THE letter from Dr. Duncombe, published elsewhere in this issue of the *Journal*, gives welcome publicity to an interesting and sometimes perplexing problem.

As Dr. Duncombe and others have noted, the *Journal* has changed its policy regarding the acceptance of advertising matter, having, in fact, adopted a completely new system in the solicitation and selection of such copy. For it now solicits its own advertisements in place of obtaining most of them through the State Journal Advertising Bureau of the American Medical Association, with which it had done business since the establishment of the Bureau some twenty years ago.

There had been much to recommend this arrangement, especially during the years when the circulation of the *Journal* had been confined largely to the fellows of the Massachusetts Medical Society and those who subscribed to it for the Case Records of the Massachusetts General Hospital—a total of around 6000 in 1934. The Bureau was and is a co-operative and helpful organization with which to do business. Only A.M.A. Council-approved products are accepted, relieving the subscribing state journals of the necessity of screening this material themselves; since the Bureau is a profit-sharing enterprise the final agency commission charge is low.

As the *New England Journal of Medicine* expanded, however, and its place as a national weekly became more apparent, with a circulation nearly five times the membership of its parent society, logical doubts arose regarding the wisdom, from a business point of view, of remaining with the Bureau. Not only did the *Journal* fail to secure certain accounts that might have come to it had it been on a more independent status, but it was believed that close adherence to the principles of the Council on Pharmacy and Chemistry was too restrictive in certain ways.

The final termination of business relations with the Bureau—all other relations remaining firm and cordial—necessitated the creation of the publication's own advertising committee to screen the products under consideration. Many of these have been rejected, including one at least that had been accepted by the Council, although the committee's policy is admittedly more liberal than that of the Council. Any departure from Council standards, however, is presumed to be only in the direction of greater latitude in the acceptance of preparations containing a number of ingredients, which the majority of physicians do not hesitate to prescribe, and in the matter of proprietary names. It is the intention of the committee to be particularly scrupulous in the acceptance of dangerous drugs and in the scrutiny of manufacturers' claims for all their products.

Obviously, consistency is hard always to maintain and sometimes the left hand fails to co-ordinate with the right. Mistakes in judgment have possibly been made, but it is hoped that time and experience will make each judgment surer.

The committee is now operating through the device of a form on which the product and the copy concerning it are rated separately in one or another of four classes. An "A" product is excellent scientifically and therapeutically and is usually a single drug. A "B" product is acceptable, but not the most desirable scientifically or in therapeutic usefulness: it may contain up to three agents. A "C" product is on the borderline. Its therapeutic value is at most questionable, and a number of agents may be contained in the preparation. A "D" product is possibly or definitely harmful.

The advertising copy relating to the products offered is classified in much the same way. "A" copy is in excellent taste and makes only conservative claims; "B" copy is in good taste and makes no more than reasonable claims; "C" copy is in poor taste and makes exaggerated claims, whereas "D" copy is in really bad taste and makes unfounded claims.

Obviously, it would be desirable to accept only those advertisements that fall into "A" and "B" groups in the classification of both product and copy, and equally obviously "D" advertisements in either group should always be rejected. The same principle should reasonably apply to a "C" for both product and copy, but various considerations may influence other decisions, as, for example, when a product may be classified as "C," but with "B" or even "A" copy, or when different members of the committee may disagree on the classification. It is also apparent that whereas a product cannot easily be changed, the advertiser may be persuaded to alter the terms in which its virtues are extolled.

The principles on which therapeutic agents may legitimately be employed are after all not greatly different from those on which medicine is practiced: to do good when possible but at least to do no harm. The philosophy of a journal's advertising policies regarding these same agents may justly be based on the same principles.

MISUNDERSTANDING AND CONFUSION

As recently as March 14, the opinion was expressed in a widely circulated column[1] that "it is unfortunate that some of the conflicting interpretations on the technical aspects of the efficacy of both gamma globulin and the trial vaccine have been aired publicly, for the result has been to create misunderstanding and confusion." But is it unfortunate?

Before this question can be fairly answered certain facts need consideration, not the least of which is that

$19,000,000 of the public's money is to be spent on the 1954 gamma-globulin program of the National Foundation for Infantile Paralysis[1] and 3,000,000 to 5,000,000 cc. of Red Cross gamma globulin are to be distributed and presumably administered.[2]

The judgments of the National Advisory Committee for Evaluation of Gamma Globulin are clear enough: "there was insufficient data in the twenty-three communities in which mass inoculations were carried out to permit the committee to conclude whether or not gamma globulin had an effect in preventing or alleviating the disease" and "the 'family contact' use of gamma globulin did not measurably reduce the number of subsequent paralytic cases in these households."[1]

Confusion is created when the head of the National Foundation for Infantile Paralysis, a layman, interprets the committee's conservative abnegation as an affirmation in a way that implies committee endorsement: "What the committee did say was that the mass inoculation methods were not used in enough places at the right point in the course of a polio epidemic in 1953 to provide enough information to enable the committee to reach any definite conclusions as to its effect."[1]

If there is "misunderstanding and confusion" about the status of gamma globulin, it has been brought about by radio voices that trumpeted the precious protein during the campaign for funds as though it were almost a cure and, at least, a satisfactory preventive for poliomyelitis. There is little misunderstanding in scientific circles, where few disinterested workers believe that gamma globulin is an epidemiologically effective preventive of poliomyelitis—or that it can become one, no matter how many millions of dollars are spent, and no matter how many uninformed broadcasters volunteer their enthusiastic endorsement.

Three points were originally at issue: whether gamma globulin alleviates paralysis if given after "family-contact" exposure; whether it prevents paralysis if given during an epidemic; and whether its influence of a few weeks' duration is enough to affect the epidemiology of poliomyelitis. Since gamma globulin has been given a fair trial and found wanting in protecting family contacts, as well as in preventing paralysis or influencing epidemics,[3] there should be little ground for continued enthusiasm for this method of bleeding part of the population for the dubious objective of postponing poliomyelitis in other parts for a month or two and at the cost of about $25,000 for each possible case postponed.

Two years ago the *Journal* summed up the case for gamma globulin as follows[4]: "In the relative calm of the off season one thing seems quite clear—that gamma globulin will not be the ultimate control measure against poliomyelitis"; a year later it was stressed[5] that "the history of measures used in the treatment and prophylaxis of poliomyelitis is full of conclusions based on inadequate material and subsequently proved to be erroneous." There is no reason why the difficulties and confusions should not be aired publicly.

References

1. Rusk, H. A. Confusion over programs to combat polio justified. *New York Times*, March 14, 1954.
2. American National Red Cross, Office of Public Information. 5,000,000 CCS. of gamma globulin provided by Red Cross in 1953. (News Release No. 2458-1253.) 2 pp. Washington, D. C., 1954.
3. National Advisory Committee for Evaluation of Gamma Globulin. Evaluation of gamma globulin in prophylaxis of paralytic poliomyelitis in 1953. *J.A.M.A.* **154**:1086-1090, 1954.
4. Editorial. Gamma globulin in poliomyelitis prevention. *New Eng. J. Med.* **248**:786, 1953.
5. Editorial. Poliomyelitis prevention and gamma globulin—re-orientation. *New Eng. J. Med.* **249**:79, 1953.

AMERICAN GOITER ASSOCIATION

THIS week Boston once more has the distinction of playing host to a convention of one of the national specialty organizations: today, at the Somerset Hotel, begins the annual three-day meeting of the American Goiter Association (a group devoted not, as its name might imply, to the propagation of goiter but to its diagnosis, treatment and cure). Another honor locally conferred is the selection of Dr. Richard B. Cattell, director of the Lahey Clinic, as president-elect of the organization.

The *Journal* heartily welcomes the fellows of the Association. The program of pleasant social entertainments and most instructive scientific sessions should inspire them to return to their patients with the forthright exhortation of a not too sedate versifier:

Reconnoiter, reconnoiter
Bare your neck
And show your goiter.

That venerable father in the profession, John C. Warren, M.D., of Boston, whose industry seems to increase with his age, has favored the public with a new edition of his universally popular digest of the laws of health, with remarks on constipation, old age, and the use of alcohol in the preparation of medicines.

Boston M. & S. J., *May 3, 1854*

MASSACHUSETTS MEDICAL SOCIETY

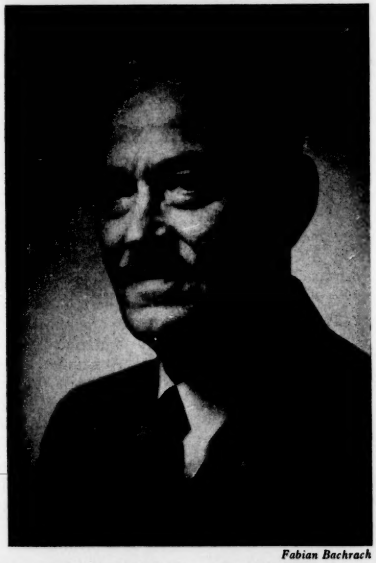
DEATH

LANDERS—Thornton A. Landers, M.D., of Whitman, died on April 13. He was in his sixty-first year.

Dr. Landers received his degree from Middlesex University School of Medicine in 1917. He was a member of the board of health, Whitman, and formerly school physician.

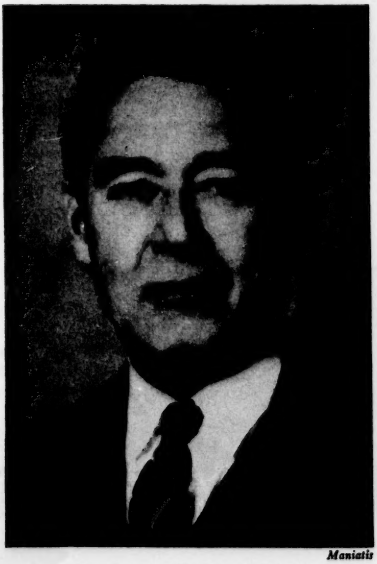
He is survived by his widow, a son, two sisters and two brothers.

OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY, 1953–1954



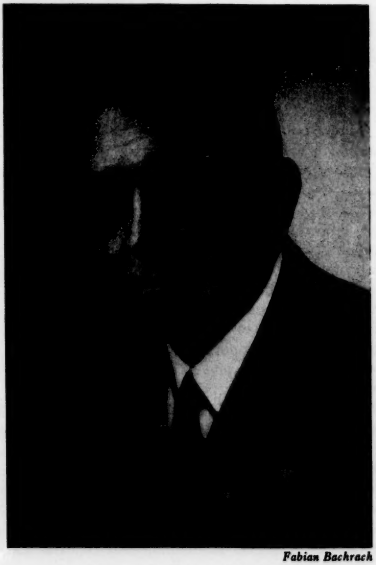
Fabian Bachrach

DR. CURTIS C. TRIPP, *President-Elect*



Maniatis

DR. FREDERIC HAGLER, *President*



Fabian Bachrach

DR. HARVEY A. KELLY, *Vice-President*

ONE HUNDRED AND SEVENTY-THIRD ANNIVERSARY OF THE MASSACHUSETTS MEDICAL SOCIETY

Tuesday, Wednesday and Thursday, May 18, 19 and 20

Hotel Statler, Boston

Committee on Nominations

The Committee on Nominations has presented the following slate to be voted upon by the Council at its annual meeting May 17, 1954:

President: Dr. Curtis C. Tripp
President-Elect: Dr. Conrad Wesselhoeft
Vice-President: Dr. Samuel A. Dibbins
Secretary: Dr. Robert W. Buck
Treasurer: Dr. Eliot Hubbard, Jr.
Assistant Treasurer: Dr. Norman A. Welch
Orator: Dr. Carl Bearse

Delegates to the American Medical Association:
To December 31, 1955:
Dr. Earle M. Chapman
Dr. Harold R. Kurth
Dr. Norman A. Welch
To December 31, 1956:
Dr. Lawrence R. Dame
Dr. Philip S. Foisie
Dr. Charles G. Hayden

Alternates:
To December 31, 1955:
Dr. Carl Bearse
Dr. Robert W. Buck
Dr. Henry F. Howe

Alternates:
To December 31, 1956:
Dr. H. Thomas Ballantine, Jr.
Dr. Lewis S. Pilcher
Dr. Nicholas S. Scarcello
Robert W. Buck, M.D., *Secretary*

Program

The Registration Desk will be located on the mezzanine floor, and all who attend the meeting are requested to register. The following events take place on the day prior to the official opening of the meeting.

MONDAY AFTERNOON, MAY 17

4:30 **Supervising Censors' Meeting** (Parlor B).

6:00 **Cotting Supper for Councilors** (Parlors A and B).

MONDAY EVENING, MAY 17

7:00 **Annual Meeting of the Council** (Georgian Room).

TUESDAY MORNING, MAY 18

First General Session
Georgian Room

9:00 *Motion picture* entitled *"Arterial Grafting."*

9:30 to 10:45 **Panel on Reparative and Reconstructive Surgery of Arteries.** Moderator: Dr. Leland S. McKittrick, clinical professor of surgery, Harvard Medical School; surgeon-in-chief, New England Deaconess Hospital; consulting visiting surgeon, Massachusetts General Hospital; consultant in surgery, Peter Bent Brigham Hospital.
Dr. Gustave J. Dammin, professor of pathology, Harvard Medical School; pathologist-in-chief, Peter Bent Brigham Hospital.
Dr. Robert R. Linton, assistant clinical professor of surgery, Harvard Medical School; visiting surgeon, Massachusetts General Hospital.
Dr. Robert S. Shaw, instructor in surgery, Harvard Medical School; assistant in surgery and assistant director of the Blood Bank, Massachusetts General Hospital.
Dr. Frank C. Wheelock, Jr., assistant in surgery, Harvard Medical School; assistant in surgery, Massachusetts General Hospital.

10:45 **Recess**

11:05 *The Relation of the Anesthesiologist to the General Practitioner.* Dr. Stevens J. Martin, director, Department of Anesthesiology, St. Francis Hospital, Hartford, Connecticut; president, American Society of Anesthesiologists; president, New England Society of Anesthesiologists.

11:30 *Physical Medicine and Rehabilitation in General Practice.* Dr. A. B. C. Knudson, associate in physical medicine and rehabilitation, George Washington University Medical School; director, Physical Medicine and Rehabilitation Service, Department of Medicine and Surgery, Veterans Administration Central Office, Washington, D.C.

TUESDAY NOON, MAY 18

Section Meetings and Luncheons
12:00 m. — 2:00 p.m.

Section of Medicine
Parlor A

Dr. Stuart N. Gardner, Salem, *Chairman*
Dr. Arthur S. Pier, Jr., Boston, *Vice-Chairman*
Dr. Ralph H. Wells, Lexington, *Secretary*

Panel on Coronary-Artery Disease. Moderator: Dr. Lewis M. Hurxthal, director, Department of Internal Medicine, Lahey Clinic; cardiologist, New England Baptist Hospital and New England Deaconess Hospital; president, Massachusetts Heart Association.
Dr. Edward F. Bland, assistant clinical professor of medicine, Harvard Medical School; physician, Massachusetts General Hospital.
Dr. Laurence B. Ellis, assistant clinical professor of medicine, Harvard Medical School; chief, Cardiac Clinic, Boston City Hospital.
Dr. Samuel A. Levine, clinical professor of medicine, Harvard Medical School; physician, Peter Bent Brigham Hospital.
Dr. Edwin O. Wheeler, assistant in medicine, Harvard Medical School; assistant physician, Massachusetts General Hospital.

Section of Radiology
Parlor B

Dr. James R. Lingley, Worcester, *Chairman*
Dr. Robert E. Grandfield, Boston, *Secretary*

Sinuses and Mastoids, Then and Now. Dr. Alexander S. MacMillan, clinical associate in radiology, Harvard Medical School; radiologist, Massachusetts Eye and Ear Infirmary.

Section of Physical Medicine
Parlor C

Dr. Jacob L. Rudd, Boston, *Chairman*
Dr. David C. Ditmore, Boston, *Secretary*

Physical Medicine and Rehabilitation: Our challenge and obligation. Dr. A. B. C. Knudson, associate in physical medicine and rehabilitation, George Washington University Medical School; director, Physical Medicine and Rehabilitation Service, Department of Medicine and Surgery, Veterans Administration Central Office, Washington, D.C.

Section of Anesthesiology

PARLORS D AND E

DR. BENJAMIN ETSTEN, Boston, *Chairman*

DR. M. GENE BLACK, Holyoke, *Secretary*

The Function of the Anesthesiologist as an Internist in the Operating Room. DR. STEVENS J. MARTIN, director, Department of Anesthesiology, St. Francis Hospital, Hartford, Connecticut; president, American Society of Anesthesiologists; president, New England Society of Anesthesiologists.

TUESDAY AFTERNOON, MAY 18

2:30 **Annual Meeting of the Massachusetts Medical Society** (GEORGIAN ROOM).

Presentation of Awards to Medical Students

Presentation of Pins to Fifty-Year Members

Annual Oration: *The Appreciation of Medical Politicians.* DR. BASIL E. BARTON, physician, Faulkner Hospital.

WEDNESDAY MORNING, MAY 19

Second General Session

GEORGIAN ROOM

9:00 *Surgical motion picture* entitled *"Congenital Hypertrophic Pyloric Stenosis."*

9:15 to 10:30 **Panel on Management of The Sick Child.** Moderator: DR. CHARLES A. JANEWAY, Thomas Morgan Rotch Professor of Pediatrics, Harvard Medical School; physician-in-chief, Children's Hospital.
DR. JOHN D. CRAWFORD, associate in pediatrics, Harvard Medical School; assistant physician, Massachusetts General Hospital.
DR. DAVID MCLEAN GREELEY, assistant dean and associate professor of pediatrics, Boston University School of Medicine.
DR. DANE G. PRUGH, associate in pediatrics, Harvard Medical School; associate physician, Children's Hospital.
DR. ORVAR SWENSON, surgeon-in-chief, Boston Floating Hospital.

10:30 **Coffee Hour.**

10:45 **Recess.**

11:05 THE SHATTUCK LECTURE. *Medical Education and the Physician.* DR. JAMES M. FAULKNER, Dean, Boston University School of Medicine.

WEDNESDAY NOON, MAY 19

Section Meetings and Luncheons

12:00 m. — 2:00 p.m.

Section of Obstetrics and Gynecology

PARLOR B

DR. SAMUEL B. KIRKWOOD, Brookline, *Chairman*

DR. JAMES J. MEEHAN, Boston, *Vice-Chairman*

DR. JOHN RUSSELL BARKER, Needham, *Secretary*

Effects of Atomic Radiation on Those Yet Unborn. DR. SAMUEL P. HICKS, assistant professor of pathology, Harvard Medical School; consultant pathologist, Pondville Hospital; pathologist, New England Deaconess Hospital.

Section of Pediatrics

PARLOR C

DR. ELI FRIEDMAN, Boston, *Chairman*

DR. HARRY L. MUELLER, Winchester, *Secretary*

DR. GERALD N. HOEFFEL, Truro, *Executive Committee*

Sexual Precocity in Boys. DR. SAMUEL Z. LEVINE, professor of pediatrics, Cornell University Medical College; pediatrician-in-chief, New York Hospital.

Section of Physiology and Pathology

PARLORS D AND E

DR. LESLIE S. JOLLIFFE, Lawrence, *Chairman*

DR. HARRY G. OLKEN, Lynn, *Secretary*

Some Aspects of Pulmonary Edema. DR. AVERILL A. LIEBOW, professor of pathology, Yale University School of Medicine; pathologist-in-chief, U Service, Grace-New Haven Community Hospital.

Section of Industrial Health

PARLOR A

DR. GEORGE E. MORRIS, Boston, *Chairman*

DR. JOHN P. CREED, Haverhill, *Secretary*

Industry's Contribution to the Future of Medicine. DR. ROBERT COLLIER PAGE, general medical director, Standard Oil Company (New Jersey); president, Industrial Medical Association.

WEDNESDAY AFTERNOON, MAY 19

Third General Session

GEORGIAN ROOM

2:00 p.m. — 5:00 p.m.

2:00 *Duodenal Ulcer: Unraveling the Gastrointestinal Tract in Ulcer Disease.* DR. FRANCIS D. MOORE, Moseley Professor of Surgery, Harvard Medical School; surgeon-in-chief, Peter Bent Brigham Hospital.

2:25 *Some Impressions of Teaching Medical Missions of the World Health Organization.* DR. SAMUEL Z. LEVINE, professor of pediatrics, Cornell University Medical College; pediatrician-in-chief, New York Hospital.

2:50 *Extra-Prostatic Factors in Urinary Retention.* DR. HERBERT S. TALBOT, chief, Paraplegia Service, and chief, Urological Section, Veterans Administration Hospital, West Roxbury.

3:15 *Mental Health and the Family.* DR. JOHN P. SPIEGEL, lecturer in social relations, Department of Social Relations, Harvard University; associate director, Institute of Psychosomatic and Psychiatric Research, Michael Reese Hospital, Chicago, Illinois.

3:40 *Immunization of Adults Against Diphtheria and Tetanus.* DR. JOHANNES IPSEN, associate professor of public health, Harvard School of Public Health; superintendent, Institute of Laboratories, Department of Public Health, Commonwealth of Massachusetts.

4:05 *Pulmonary Tuberculosis in Northern Newfoundland and Labrador.* DR. GORDON W. THOMAS, surgeon-in-charge, International Grenfell Association Hospital, St. Anthony, Newfoundland.

4:30 *Recent Advances in the Therapy of Bronchial Asthma and Emphysema.* DR. MAURICE S. SEGAL, clinical professor of medicine, Tufts College Medical School; director, Department of Inhalational Therapy, Boston City Hospital.

WEDNESDAY EVENING, MAY 19

6:00 - 7:00 **Cocktail Party** (PARLORS A, B and C).

7:00 **Annual Dinner of the Massachusetts Medical Society** (GEORGIAN ROOM).

Presiding: DR. FREDERIC HAGLER, president, Massachusetts Medical Society.

Guest Speakers: DR. EDWARD J. MCCORMICK, president, American Medical Association. Subject to be announced.
DR. CHARLES S. HOUSTON, Exeter, New Hampshire. "Adventures of a Medical Mountaineer."

Ladies may be invited to attend the dinner.

Tickets for the cocktail party and dinner must be procured in advance.

THURSDAY MORNING, MAY 20

Fourth General Session

GEORGIAN ROOM

9:00-12:00 Grand Rounds televised (screen 12 by 16 ft.) from Massachusetts General Hospital, through the courtesy of Wyeth Laboratories, Philadelphia, Pennsylvania.

9:00 Surgical Rounds.

10:00 Medical Rounds.

11:00 Clinicopathological Conference.

THURSDAY NOON, MAY 20

Section Meetings and Luncheons

12:00 m. — 2:00 p.m.

Section of Surgery

PARLOR B

DR. RICHARD H. THOMPSON, Salem, *Chairman*

DR. CHESTER HOWE, Boston, *Secretary*

DR. FREDERICK P. ROSS, Fitchburg, *Executive Committee*

DR. DOUGLAS A. FARMER, Boston, *Executive Committee*

Billroth I Hemigastrectomy Combined With Vagotomy for Duodenal Ulcer. (Illustrated by a motion picture.) DR. ROBERT M. ZOLLINGER, professor and chairman, Department of Surgery, Ohio State University Hospital, Columbus, Ohio.
Discusser: DR. REGINALD H. SMITHWICK, professor of surgery, Boston University School of Medicine; surgeon-in-chief, Massachusetts Memorial Hospitals.

Section of Dermatology

PARLORS D AND E

DR. ALFRED HOLLANDER, Springfield, *Chairman*

DR. WILLIAM R. HILL, JR., Boston, *Secretary*

Pruritic Skin Disorders: Newer aspects of mechanism and treatment. DR. HERBERT MESCON, professor of dermatology, Boston University School of Medicine; chief of dermatology, Massachusetts Memorial Hospitals.

Section of Ophthalmology and Otolaryngology

PARLOR C

DR. BRENDAN D. LEAHEY, Lowell, *Acting Chairman*

DR. JOHN E. MCKEIGUE, Arlington, *Secretary*

Motion pictures entitled *Simplified Dacryocystorhinostomy,* prepared by CHARLES E. ILIFF, M.D., and *Dacryocystorhinostomy,* prepared by HAROLD GIFFORD, M.D., Omaha, Nebraska.

Section of Psychiatry and Neurology

PARLOR A

DR. DAVID ROTHSCHILD, Worcester, *Chairman*

DR. HARRY C. SOLOMON, Boston, *Secretary*

The Impact of the Family on Physical and Mental Health. DR. JOHN P. SPIEGEL, lecturer in social relations, Department of Social Relations, Harvard University; associate director of Institute for Psychosomatic and Psychiatric Research, Michael Reese Hospital, Chicago, Illinois.

THURSDAY AFTERNOON, MAY 20

Fifth General Session

GEORGIAN ROOM

2:00 *Pancreatitis.* DR. ROBERT M. ZOLLINGER, professor and chairman, Department of Surgery, Ohio State University Hospital, Columbus, Ohio.

2:25 *The Physiologic Approach to Disorders of the Skin.* DR. WALTER C. LOBITZ, JR., assistant professor of dermatology and syphilology, Dartmouth Medical School; member, dermatology staff, Hitchcock Clinic; staff member, Mary Hitchcock Memorial Hospital, Hanover, New Hampshire.

2:50 *An Analysis of Missed Diagnoses in Head and Neck Tumors.* DR. G. DAVID KING, associate otolaryngologist, Lahey Clinic; member of staff, New England Deaconess Hospital and New England Baptist Hospital.

3:15 **Recess.**

3:30 to 5:00 **Panel Discussion on Epilepsy.** *Recent Progress and Practical Considerations.* Moderator: DR. ROBERT S. SCHWAB, assistant clinical professor of neurology, Harvard Medical School; director of the Brain Wave Laboratory and neurologist, Massachusetts General Hospital.
DR. DOUGLAS T. DAVIDSON, instructor in pediatrics, Harvard Medical School; associate physician and associate in Seizure Division, Children's Hospital.
DR. JOSEPH M. FOLEY, assistant professor of neurology, Harvard Medical School; assistant visiting neurologist and neuropathologist, Boston City Hospital.
DR. HANNIBAL HAMLIN, instructor in neurosurgery, Tufts College Medical School; clinical associate in neurosurgery, Massachusetts General Hospital; associate neurosurgeon, Rhode Island Hospital, Providence, Rhode Island.
DR. JEROME K. MERLIS, assistant in neurology, Harvard Medical School; clinical associate in neurology, Massachusetts General Hospital; chief, National Veterans Epilepsy Center, Veterans Administration Hospital, Boston.
MISS CONSTANCE RATHBUN, director of case work, Children's Aid Association, Inc., Boston.
DR. EDWARD P. RICHARDSON, JR., instructor in neurology, Harvard Medical School; assistant neurologist and assistant neuropathologist, Massachusetts General Hospital.
DR. WILLIAM W. SARGANT, professor of psychiatry, University of London; chief, Department of Psychiatry, St. Thomas's Hospital, London, England.
DR. NATHAN B. TALBOT, associate professor of pediatrics, Harvard Medical School; physician, Children's Medical Service, Massachusetts General Hospital.

SCIENTIFIC EXHIBITS

BOOTH NO.

82 — SURGICAL LESIONS OF THE UPPER URINARY TRACT IN CHILDHOOD.
Exhibitor: Dr. Kenneth J. Welch.

83 — DERMATOSES OF THE FEET.
Exhibitor: Dr. Arthur S. Spangler.

84–85 — REHABILITATION OF THE PSYCHIATRIC PATIENT.
Sponsor: Veterans Administration Hospital, Bedford, Massachusetts.
Exhibitor: Physical Medicine and Rehabilitation Service, Veterans Administration.

86 — PROSTATOGRAPHY.
Sponsor: Departments of Urology and Roentgenology, Beth Israel Hospital and Tufts College Medical School.
Exhibitors: Dr. M. Leopold Brodny, Dr. Samuel A. Robins and Dr. Hyman A. Hershman.

87 — HOW YOUR HEART ASSOCIATION HELPS THE PHYSICIAN.
Sponsor: Massachusetts Heart Association.

88 — GENERAL PRACTICE.
Sponsor: Massachusetts Academy of General Practice.

89 — ELECTRON THERAPY IN SKIN DISEASES.
Sponsor: Lahey Clinic.
Exhibitors: Dr. Magnus I. Smedal and Dr. John L. Fromer, Lahey Clinic; John G. Trump, D.Sc., Kenneth A. Wright, B.A., B.S., Massachusetts Institute of Technology.

90 — THE ECONOMIC ASPECTS OF BURNS.
Sponsor: The Children's Medical Center.
Exhibitors: Dr. Donald W. MacCollum and Dr. Lendon Snedeker.

91 — THE SERVICES OF THE BOSTON MEDICAL LIBRARY.
Sponsor: The Boston Medical Library.

PARLOR—THE PLATELETS AND IDIOPATHIC THROMBOCYTOPENIC PURPURA.
Exhibitors: Dr. William Dameshek and Dr. Mario Stefanini.

CORRIDOR—PROGRESS UNDER THE HILL-BURTON PROGRAM.
Sponsor: Department of Public Health, Commonwealth of Massachusetts.

CORRIDOR—GASTROSCOPY. CONTRIBUTIONS TO THE DIAGNOSES OF BENIGN AND MALIGNANT LESIONS OF THE STOMACH.
Sponsor: Tufts College Medical School.
Exhibitors: Dr. Emmanuel Deutsch and Dr. Daniel L. Shaw, Jr.

TECHNICAL EXHIBITORS
1954

	BOOTH NO.
Abbott Laboratories	19 & 20
The Alkalol Company	25
Ames Company, Inc.	37
Ayerst, McKenna & Harrison, Ltd.	24
Baby Development Clinic	15
Chester A. Baker Laboratories, Inc.	69
The Baker Laboratories, Inc.	39
Beech-Nut Packing Company	63
Bilhuber-Knoll Corporation	28
Ernst Bischoff Company, Inc.	22
The Borden Company	76
Brewer & Company, Inc.	29
Brown and Connolly, Inc.	18
Buffington's, Inc.	55
Burroughs Wellcome & Co., Inc.	27
Cambridge Instrument Company, Inc.	11
Cardiotron (Samuel Mushlin)	8-A
Carnation Company	13
Ciba Pharmaceutical Products, Inc.	32
The Coca-Cola Company	59
Coles Electronic Corporation	1
Crosbie-Macdonald	49
Davies, Rose & Company, Ltd.	44
The Denver Chemical Manufacturing Co., Inc.	4
Desitin Chemical Company	2
Doho Chemical Corporation	40
Dy-Dee Service, Inc.	12
Eaton Laboratories, Inc.	62
Endo Products, Inc.	53
Charles O. Finley & Company	79
W. J. Fitzgerald Corporation	Stage D
C. B. Fleet Company, Inc.	47
Geigy Pharmaceuticals	Stage C
Gerber Products Company	73
Lawrence E. Gott	6
J. E. Hanger, Inc.	38
H. J. Heinz Company	23
Hoffmann-La Roche, Inc.	34
H. P. Hood & Sons	58
Horlicks Corporation	10
Ives-Cameron Company, Inc.	3
George Laben	31
Lederle Laboratories	68
Eli Lilly and Company	33
E. F. Mahady Company	70 & 71
M & R Laboratories	66
McNeil Laboratories, Inc.	51
Mead Johnson & Company	65
Medical Clearing Bureau, Inc.	7-A
The Medical Protective Company	30
The Wm. S. Merrell Company	52
The National Drug Company	36
Nepera Chemical Company, Inc.	Stage B
New England Dairy and Food Council	64
Parke, Davis & Company	42
The E. L. Patch Company	17
Pet Milk Company	45
Pfizer Laboratories	54
Postgraduate Medical Institute	7
Professional and Hospital Equipment Company	9
L. & B. Reiner, Inc.	56 & 57
R. J. Reynolds Tobacco Company	16
A. H. Robins Company, Inc.	50
Sanborn Company	67
Sandoz Pharmaceuticals	41
Schenley Laboratories, Inc.	14
Schering Corporation	74
Sealy Mattress Company	5
G. D. Searle & Company	72
Sharp & Dohme	81
Carroll Dunham Smith Pharmacal Company	64-A
Smith, Kline & French Laboratories	46
Smith's Photographic Store	1-A
E. R. Squibb & Sons	48
Surgeons' and Physicians' Supply Company	75
Swift & Company	61
Tailby-Nason Company	21
U. S. Vitamin Corporation	8
The Upjohn Company	80
VanPelt & Brown, Inc.	78
Varick Pharmacal Company, Inc.	60
Walker Laboratories, Inc.	92
Warner-Chilcott Laboratories	77
White Laboratories, Inc.	35
Winthrop-Stearns, Inc.	43
Wyeth Laboratories	26

BOSTON MEDICAL LIBRARY
ANNUAL MEETING
MONDAY AFTERNOON, MAY 17
PARLOR C
4:30 p.m.

MASSACHUSETTS MEDICO-LEGAL SOCIETY
ANNUAL MEETING
WEDNESDAY AFTERNOON, MAY 19
PARLOR C
2:30 p.m.

MASSACHUSETTS SCHOOL PHYSICIANS' ASSOCIATION
ANNUAL MEETING
WEDNESDAY AFTERNOON, MAY 19
PARLOR B
2:15 p.m.

EXHIBITION OF WORKS OF ART
BY MEMBERS OF THE MASSACHUSETTS PHYSICIANS ART SOCIETY
FOURTH FLOOR
Daily: 9:00 a.m. — 5:00 p.m.
MAY 18, 19 and 20

ANNUAL GOLF TOURNAMENT
WOLLASTON GOLF CLUB
WOLLASTON, MASSACHUSETTS
WEDNESDAY AFTERNOON, MAY 19
1:00 p.m.

AMERICAN MEDICAL WOMEN'S ASSOCIATION
NORTHERN NEW ENGLAND BRANCH
LUNCHEON MEETING
WEDNESDAY, MAY 19
HANCOCK ROOM, HOTEL STATLER
12:00 m. — 2:30 p.m.

WOMAN'S AUXILIARY OF THE MASSACHUSETTS MEDICAL SOCIETY

The registration desk for the meeting on May 18 will be in the lobby, Hotel Vendome, with registration from 9:00 a.m. to 4:00 p.m., and the registration desk for the meeting on May 19 will be in the mezzanine, Hotel Statler, with registration from 9:00 a.m. to 3:00 p.m.

TUESDAY MORNING, MAY 18

10:30 **Annual Meeting** (SALON, FIRST FLOOR, HOTEL VENDOME).

TUESDAY AFTERNOON, MAY 18

1:15 **Luncheon** (EMPIRE ROOM, FIRST FLOOR, HOTEL VENDOME; $2.88, including Tax and Tip).

3:15 **Executive Board Meeting** (MARLIN ROOM, HOTEL VENDOME).

4:00–6:00 **Sherry Party** (MASSACHUSETTS MEDICAL SOCIETY, 22 FENWAY).

WEDNESDAY MORNING, MAY 19

10:30 **Bus Tour Starting from Columbus Avenue Entrance of the Hotel Statler for the Adams Mansion, Quincy.** (Transportation provided.)

11:00 **Tour of the Adams Mansion.** (Buses leave the Adams Mansion at 12:00 noon for the Hobomock Inn, Pembroke.)

1:15 **Luncheon** (Hobomock Inn, Pembroke; $2.88, including Tax and Tip).

WEDNESDAY EVENING, MAY 19

6:00–7:00 **Cocktail Party** (with members of the Massachusetts Medical Society, Hotel Statler).

7:00 **Dinner** (with members of the Massachusetts Medical Society, Hotel Statler).

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

COMMUNICABLE DISEASES IN MASSACHUSETTS FOR MARCH, 1954

RÉSUMÉ

Disease	March 1954	March 1953	Seven-Year Median
Chancroid	3	6	3
Chicken pox	2045	4365	2412
Diphtheria	4	0	15
Dog bite	1184	891	847
Dysentery, bacillary	18	4	9
Encephalitis, infectious	8	4	4
German measles	293	906	351
Gonorrhea	156	174	211
Granuloma inguinale	1	1	0
Hepatitis, infectious	173	92	123
Lymphogranuloma venereum	3	1	1
Malaria	2	0	0
Measles	509	420	1835
Meningitis, meningococcal	11	5	6
Meningitis, Pfeiffer bacillus	4	8	4
Meningitis, pneumococcal	0	3	3
Meningitis, staphylococcal	0	0	0
Meningitis, streptococcal	0	4	1
Meningitis, undetermined	3	7	5
Mumps	3024	1395	1479
Poliomyelitis	7	5	1
Salmonellosis	41	25	11
Scarlet fever	771*	559	564
Syphilis	185	108	203
Trichinosis	0	0	2
Tuberculosis, pulmonary	217	187	197
Tuberculosis, other forms	11	14	15
Typhoid fever	2	8	1
Undulant fever	0	1	2
Whooping cough	338	125	241

*Includes streptococcal sore throat.
†Five-year median.

Comment

Diseases below the seven-year median were chicken pox, diphtheria, German measles and measles.

Although the 2045 cases of chicken pox reported during March did not constitute a record low, they represented, as could have been expected, a considerable drop from the early months of last year when record high levels were established.

The figures for diphtheria and measles were somewhat different. Though both were well below the seven-year median, the 4 and 509 cases reported for these diseases, respectively, represented increases over March, 1953. This was not unexpected since record lows (no cases of diphtheria) were established during the latter month.

Diseases above the seven-year median were bacillary dysentery, infectious hepatitis, meningococcal meningitis, mumps, poliomyelitis, salmonellosis, scarlet fever and whooping cough.

In general the enteric diseases maintained their high level. One encouraging feature is that the 18 cases of bacillary dysentery, although a good deal above the seven-year median, represented a marked drop from the 96 cases reported during the preceding month.

The 3024 cases of mumps reported made this the highest figure for the month of March in the history of this state.

Geographical Distribution of Certain Diseases

The following diseases were reported from the communities named:

Diphtheria: Boston, 1; Canton, 1; Melrose, 2; total, 4.

Dysentery, bacillary: Boston, 1; Brimfield, 4; Danvers, 2; Lawrence, 8; Somerset, 1; Worcester, 2; total, 18.

Encephalitis, infectious: Bedford, 1; Brockton, 1; Leominster, 1; Newton, 1; Pittsfield, 1; Swansea, 1; Wellesley, 1; Worcester, 1; total, 8.

Hepatitis, infectious: Adams, 1; Auburn, 1; Belchertown, 4; Boston, 26; Braintree, 1; Brockton, 10; Cambridge, 13; Chelsea, 5; Chelsea Naval Hospital, 11; Chicopee, 1; Fort Devens, 1; Framingham, 1; Freetown, 2; Greenfield, 3; Hanson, 1; Holyoke, 3; Leominster, 1; Lowell, 1; Lynn, 12; Malden, 1; Mansfield, 5; Medford, 1; Milford, 1; Millbury, 1; Natick, 4; Needham, 2; New Bedford, 1; North Adams, 2; Otis Air Force Base, 3; Oxford, 1; Plymouth, 13; Quincy, 1; Revere, 4; Richmond, 1; Shrewsbury, 2; Somerville, 1; Springfield, 12; Stoneham, 1; Stoughton, 1; Stow, 1; Tyngsboro, 1; Waltham, 1; Wareham, 1; Webster, 4; Wellesley, 1; Williamstown, 1; Worcester, 7; total, 173.

Malaria: Chelsea Naval Hospital, 1; Concord, 1; total, 2.

Meningitis, meningococcal: Belchertown, 1; Boston, 3; Brockton, 1; Lexington, 1; Malden, 1; Springfield, 2; Topsfield, 1; Worcester, 1; total, 11.

Meningitis, Pfeiffer bacillus: Lancaster, 1; Lynn, 1; Marblehead, 1; Webster, 1; total, 4.

Meningitis, undetermined: Auburn, 1; Belmont, 1; Ludlow, 1; Worcester, 1; total, 4.

Poliomyelitis: Danvers, 1; New Bedford, 6; total, 7.

Salmonellosis: Arlington, 1; Barre, 2; Belmont, 2; Boston, 8; Clinton, 3; Everett, 2; Fall River, 1; Kingston, 1; Lowell, 4; Medford, 7; Palmer, 1; Somerville, 1; Springfield, 1; Wellesley, 1; Winchester, 2; Winthrop, 3; Worcester, 1; total, 41.

Typhoid fever: Boston, 1; Fall River, 1; total, 2.

CORRESPONDENCE

REGARDING ADVERTISEMENTS

To the Editor: A number of our colleagues have been disturbed concerning the new advertising policy of the *Journal*.

The article on postgraduate medical education by Dr. Daniel S. Ellis in the February 11 issue implies that one of our major problems is that of continuing high standards of education for the general practitioner. It is to the general practitioner that most drug advertising is directed. The Merck Report of January, 1954, states that "a group of only 23,000 general practitioners who write twenty-five or more prescriptions a day, is responsible for the major part of the prescription volume in the United States." Obviously, this is the group that the drug house attempts to reach.

In the past, advertisements in the *Journal* have been reasonably conservative, and the multiple "shotgun" preparations have seldom appeared in its pages. This has changed rapidly, and certainly it cannot be that this is a result of a change in the editorial policy or standards of the *Journal*.

On October 4, 1951, the editor states: "The use of most preparations that contain mixtures of effective medicaments, whether they be vitamins, antibiotics or other pharmacologically active agents, is always to be condemned . . . the anemias offer an excellent opportunity for the application of the principle of therapeutic dissection." In 1954 we find advertising for a "hematinic concentrate with intrinsic factor," two a day for anemias. This manufacturer, in a direct mail promotion of the product, goes farther and uses the phrase "for all treatable anemias." The advertising does not give the exact formula. It contains liver-stomach concentrate, vitamin B_{12}, ferrous sulfate, ascorbic acid and folic acid. Here, there is no "therapeutic dissection."

An editorial of December 20, 1951, criticizes antibiotic combinations, particularly that of triple sulfonamides with penicillin. Within the month advertising for two different quadri-sulfonamides with penicillin have appeared in the *Journal*. A fourth sulfonamide has been added to the previously criticized three.

On February 8, 1951, Dr. Finland stated in the *Journal*: "Antibiotics, however, should not be used routinely for all mild cases of the grippe, and most cases in any epidemic of influenza are mild." In the February 11, 1954, issue an advertiser specifically recommends the use of "the new quadri-sulfa mixture with penicillin" for influenza. In the same issue another manufacturer advises the use of three antibiotics in the form of a lozenge, "especially in non-febrile sore throat."

Dr. Thannhauser, on Page 695 of Volume 246, states: "The use of so-called lipotropic substances like cholin, methionine or inositol was not effective in our hands in reducing the serum cholesterol." An advertisement in the February 25, 1954, issue advises that these substances, with vitamin B_{12} and liver concentrate added, reduce elevated cholesterol levels in addition to other alleged lipotropic virtues.

The multiple-vitamin field hardly deserves comment. However, in the January 21, 1954, issue, a manufacturer suggests to the general practitioner that older people require a "geriatric vitamin-mineral supplement." This is an amazing preparation. It contains twenty-five ingredients. According to the manufacturer, the need for ten of the twenty-five in

human nutrition has not been established. The fact that the need for a substance has not been established is a curious indication for its prescription. This preparation is a particularly vicious one. It contains iron, which could delay the appearance of iron-deficiency anemia, if the older person was unfortunate enough to have a little bleeding from an early malignant lesion of the gastrointestinal tract. It contains enough folic acid to confuse the picture of pernicious anemia and combined-system disease. This situation has been commented on editorially in the *Journal*.

These four examples do not include all the advertising that I consider objectionable and misleading, but should serve to call attention to the problem. If the Massachusetts Medical Society, through its journal, wishes to maintain a high standard of education for the general practitioner, all advertising should be reviewed critically with standards equal to or even more rigid than those applied to original articles, reports of medical progress or editorial comments. Unfortunately, many practitioners will be more influenced by the full-page advertisement than by the small paragraph in an editorial or original article.

One more quotation from the editorial pages is perhaps relevant. A physician's letter, on July 30, 1953, contains the phrase, "A group has the same responsibility and obligation to maintain medical ethics as does an individual practitioner." The editor comments: "The word 'group' was not intended to designate . . . any specific organization for the practice of medicine. It may indeed be extended to include any organization of physicians, however organized, who might fall into the error of overlooking their moral obligations to the community and their fellow practitioners."

I do not believe that the editors of the *Journal* should accept advertising for any product that they would not be prepared to support in the editorial pages and would not, as practicing physicians, use in their own professional work. Acceptance of copy should imply approval of the product and the direct mail promotional literature that eventually finds its way to each physician, or at least to his secretary. A high standard of postgraduate medical education cannot be a double one, high in the ethical and scientific areas and average or even low in the fiscal.

ALFRED L. DUNCOMBE, M.D.
Brockton, Massachusetts

BOOK REVIEWS

Bodily Physiology in Mental and Emotional Disorders. By Mark D. Altschule, M.D. 8°, cloth, 228 pp. New York: Grune and Stratton, 1953. $5.75.

In the continuing struggle to define the limits of mind and body, particularly in the field of mental and emotional disorders, physiology remains a basic yardstick to which physicians must return to make any substantial measurement. This volume is primarily a digest and review of extensive reading in the literature of psychiatry and related fields, as well as the experience of the author in integrating his findings. The book is so well organized that one can quickly find what one needs in relation to special problems. The carefully compiled comments and references that accompany each chapter are particularly valuable.

This book, which represents intense crystallization of a very diffuse area of medicine, includes, on the one hand, basic physiology and, on the other, a practical approach to mental and emotional disorders. The author deserves credit for careful sifting and much sound thinking. The general practitioner, as well as the specialist, will find the book of value for reading and for reference.

Dr. Altschule has a literary touch that adds to the interest of each chapter.

MERRILL MOORE, M.D.

Physiological Foundations of Neurology and Psychiatry. By Ernst Gellhorn, M.D., Ph.D. Minneapolis: University of Minnesota Press, 1953. $8.50.

Professor Gellhorn has spent many years collecting the material now published in this book. The biographic index of authors has been carefully sorted until only the most pertinent references remain. This book demonstrates an important trend in modern medicine manifested by an effort to return to the basic physiologic foundations of neurology and psychiatry as an explanation of clinical and psychologic phenomena. The author has undertaken a Herculean task, but his performance is distinguished, and this book in six parts, with 20 chapters, covers all modern information on the nervous system, with corresponding psychiatric implications. The chapter on the physiology of consciousness is especially interesting, as is the one on the pathology of consciousness. Many familiar terms, such as "homeostasis" and "schizophrenia," are treated in scholarly detail that will please the practicing neurologist and psychiatrist, and will stimulate the practitioner and medical student to further reading.

MERRILL MOORE, M.D.

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

Physiological Methods in Clinical Practice. By William S. Middleton, M.D., Department of Medicine, University of Wisconsin Medical School. The Beaumont Lecture, Wayne County Medical Society, February 2, 1953. 8°, paper, 40 pp. Springfield, Illinois: Charles C Thomas, 1953. $1.00. (Publication No. 216, *American Lecture Series.*)

The author presents a short and interesting historical account of the relation of physiology to medicine from the earliest times to the present. The small pamphlet should be in all medical-history collections.

The Psychoanalytic Study of the Child. Volume 8. Managing editors, Ruth S. Eissler, M.D., Anna Freud, LL.D., Heinz Hartman, M.D., and Ernest Kris, Ph.D. 8°, cloth, 412 pp. New York: International Universities Press, Incorporated, 1953. $7.50.

The papers in this new volume of a standard serial are divided into six categories: problems of early development; psychosexual development; development of the ego and some of its functions; ego pathology; clinical problems; and applied psychoanalysis. The series should be in collections on the subject.

The Gold-Headed Cane. By William Macmichael, M.D. With a foreword by James J. Waring, M.D., and a preface by William J. Kerr, M.D. (A new edition containing the text and illustrations of the fifth edition, including the introduction by George C. Peachey and his annotations.) 4°, cloth, 185 pp., with illustrations. Springfield, Illinois: Charles C Thomas, 1953. $6.50.

This new edition of an important book in the field of the history of medicine is a worthy substitute for the expensive first and second editions published in 1827 and 1828. A reprint of the Peachey edition (London, 1923), it contains material not in the original editions, with many annotations. The preface presents the history of the gold-headed-cane awards inaugurated by the University of California School of Medicine in 1939 and continued to date.

Epidemiology and Control of Endemic Syphilis: Report on a mass-treatment campaign in Bosnia. By E. I. Grin, M.D., director, Central Dispensary for Skin and Venereal Diseases, Sarajevo, Yugoslavia. 8°, paper, 93 pp., with 43 illustrations. Geneva: World Health Organization, 1953. $1.00. *(World Health Organization Monograph Series* No. 11.)

This report presents the results of a nation-wide syphilis program carried out by the Yugoslav health administration since 1948.

Influenza: A review of current research. By various authors. 8°, paper, 223 pp., with 21 illustrations. Geneva: World Health Organization, 1954. $2.50. *(World Health Organization Monograph Series* No. 20.)

This important monograph by a number of persons discusses the various aspects of influenza in the light of modern research. The articles are divided into three sections—on

epidemiology, virus and control. A select bibliography of 396 titles is appended to the text, and there is a good index. The book should be in all collections on infections.

Aspects of the Psychology of the Tuberculous. By Gordon F. Derner, Ph.D., associate professor of psychology and director of clinical psychology training program, Adelphi College, Garden City, New York. 8°, cloth, 119 pp., with 34 tables. New York: Paul B. Hoeber, Incorporated, 1953. $3.50. *(A Psychosomatic Medicine Monograph.)*

In this study carried out in the Tuberculosis Division of the Grasslands Hospital, Valhalla, New York, 36 patients were especially selected and tested for attitudes and feelings as revealed by interviews, and personality as revealed by psychological instruments. The text concludes with a number of summaries and implications, among which may be mentioned the following: "There is no unique tuberculosis personality demonstrated in this study, but there was a wide variety of disturbed behavior"; and "The diagnosis and treatment of tuberculosis necessitates a consideration of the patient's fears and concerns related to the disease and its concomitants. The approach to the patient should be psychotherapeutic in orientation." There is a bibliography and an index. The monograph should be in collections on tuberculosis and on applied psychology.

Physical Medicine and Rehabilitation. Edited by Basil Kiernander, M.B., M.R.C.P., D.M.R.E., D.Phys. Med., director, Physical Medical Department, Hospital for Sick Children, Great Ormond Street, London, and Royal National Ear, Nose and Throat Hospital, and civilian principal specialist in physical medicine, Royal Air Force. With an introduction by The Right Honorable Lord Horder, G.C.V.O., M.D., F.R.C.P., president, British Association of Physical Medicine. 8°, cloth, 610 pp., with illustrations. Springfield, Illinois: Charles C Thomas, 1953. $12.75.

This composite English book is the joint work of 26 authors. It covers the fields of rehabilitation and physical medicine. The printing was done in Holland, and the publishing is excellent. The book is recommended for all medical libraries and to all persons interested in the subjects.

Fundamentals of Biochemistry in Clinical Medicine. By Niels C. Klendshoj, M.D., assistant professor of pathology and director, Division of Toxicology, University of Buffalo School of Medicine, and director, Department of Biochemistry, Buffalo General Hospital, Buffalo, New York. 4°, cloth, 276 pp., with 18 illustrations. Springfield, Illinois: Charles C Thomas, 1953. $7.75.

This book has been written especially for physicians and surgeons for the purpose of presenting the fundamentals of biochemistry and their application to clinical chemistry. Short lists for supplementary reading are appended to the chapters. The volume should prove useful to the persons for whom it was written.

Annual Epidemiological and Vital Statistics, 1947-1949. Part II, Cases of and Deaths from Notifiable Diseases. 4°, paper, 291 pp. Geneva: World Health Organization, 1953. $3.75.

This is the second part of an important report on vital statistics. The first, on the causes of death for the same period, was published previously. This part presents information on cases of and deaths from notifiable diseases, some 30 in number. The statistics are drawn from more than 200 countries. A table lists the diseases that were notifiable in a number of countries on December 31, 1949. There is a good index in English and French.

Advances in the Control of Zoonoses: Bovine tuberculosis, brucellosis, leptospirosis, Q fever, rabies. WHO/FAO Seminar on Zoonoses, Vienna, November 1952. 8°, paper, 276 pp., with illustrations. Geneva: World Health Organization, 1953. $3.00. *(World Health Organization Monograph Series* No. 19.)

This seminar was held in Vienna in November, 1952, under the auspices of WHO and FAO (Food and Health Organization) of the UN for the purpose of discussing the five zoonoses most prevalent in Europe. About 50 physicians and veterinarians presented 17 papers on the diseases. The monograph should be in all collections on infectious diseases.

Disability Evaluation: Principles of treatment of compensable injuries. By Earl D. McBride, M.D., assistant professor in orthopedic surgery, University of Oklahoma School of Medicine, attending orthopedic surgeon to St. Anthony's Hospital, associate orthopedic surgeon to Wesley Hospital, visiting surgeon to W. J. Bryan School for Crippled Children, and chief of staff to Bone and Joint Hospital, Oklahoma City, Oklahoma. Fifth edition. 8°, cloth, 715 pp., with 375 illustrations. Philadelphia: J. B. Lippincott Company, 1953. $15.00.

This new edition of an authoritative treatise has been revised and brought up to date. Material on the causal relation of injury to disease and on the rating of the disability of disease has been added. The rating schedule of partial permanent disability has been improved and enlarged. There is a short bibliography and a good index. The book is recommended for all collections on injury and compensation insurance.

Nutritional Studies in Adolescent Girls and Their Relation to Tuberculosis. By Joseph A. Johnston, M.D., pediatrician-in-chief, Henry Ford Hospital and the Edsel B. Ford Institute for Medical Research, Detroit. 8°, cloth, 320 pp., with 194 illustrations. Springfield, Illinois: Charles C Thomas, 1953. $7.50.

Dr. Johnston presents the record of a twenty-year nutritional study of girls, most of whom had tuberculosis. Two thirds of the book deals with metabolic observations, documented with case histories, x-ray films and charts. There is a long chapter on the factors affecting retention of nitrogen and calcium in the period of growth. There is a short bibliography, and the publishing is excellent. The monograph should be in all collections on pediatrics and tuberculosis.

Films in Psychiatry, Psychology and Mental Health. By Adolf Nichtenhauer, M.D., Marie L. Coleman, and David S. Ruhe, M.D. 8°, cloth, 269 pp. New York: Health Education Council, 1953. $6.00. (Medical Audiovisual Institute of the Association of American Medical Colleges.)

This guide to films in a special field is divided into three parts: The first comprises a small collection of illustrations, the second a discussion of film-reviewing technics, with suggestions for use, and the third a review of representative films in neurology, psychiatry and mental health. There is a chapter on the history during the past fifty years, and an audience guide for forty-one films. There is a good index.

Surgery of the Biliary Tract, Pancreas and Spleen. By Charles B. Puestow, M.D., Ph.D. (Surg.), clinical professor of surgery, College of Medicine and Graduate College, University of Illinois, attending surgeon, University of Illinois Research and Educational Hospitals, chief, surgical service, Veterans Administration Hospital, Hines, Illinois, and chief surgeon, Henrotin Hospital, Chicago. 8°, cloth, 370 pp., with 72 plates. Chicago: Year Book Publishers, Incorporated, 1953. $9.00. *(A Handbook of Operative Surgery.)*

This new volume in the *Handbook* series describes the various selected operations, with diagrammatic plates illustrating each operation. The book is a practical one and does not refer to the literature of the subject. There is a good index.

Diseases of the Retina. By Herman Elwyn, M. D., senior assistant surgeon, New York Eye and Ear Infirmary. Second edition. 8°, cloth, 713 pp., with 243 illustrations. New York: Blakiston Company, 1953. $12.00.

The author has revised this new edition of his special work to bring it up to date. Chapters on retrolental fibroplasia, ocular tuberculosis and sarcoidosis have been added. Also, a classification on diseases with a hereditary basis has been incorporated in that chapter. The chapters on essential hypertension and diabetic retinopathy have been rewritten. Lists of references are appended to the chapters; there is a good index, and the publishing is excellent.

NONCLINICAL NOTES

NEW ENGLAND SOCIETY OF PSYCHIATRY

At a meeting of the New England Society of Psychiatry the following officers were elected for the coming year: president, Dr. Peter B. Hagopian, Danvers State Hospital, Hathorne, Massachusetts; vice-president, Dr. Ronald H. Kettle, Norwich State Hospital, Norwich, Connecticut; secretary-treasurer, Dr. Clementine C. McKeon, Veterans Administration Hospital, Bedford, Massachusetts; and councilors, Dr. J. Butler Tompkins, Brattleboro Retreat, Brattleboro, Vermont, and Dr. Edgar C. Yerbury, Connecticut State Hospital, Middletown, Connecticut.

NEW ENGLAND SOCIETY OF ANESTHESIOLOGISTS

The New England Society of Anesthesiologists announces the election of the following officers for the coming year: president, Dr. Elihu Saklad, Providence, Rhode Island; vice-president, Dr. Richard Barrett, Hanover, New Hampshire; secretary-treasurer, Dr. Albert Gigot, Boston, Massachusetts.

NOTICES

CONGRESS OF OBSTETRICS AND GYNECOLOGY

The sixth American Congress on Obstetrics and Gynecology will be held at the Palmer House, Chicago, December 13 through 17. The meeting will be sponsored by the American Committee on Maternal Welfare and the American Academy of Obstetrics and Gynecology. Further information may be obtained from the Sixth American Congress on Obstetrics and Gynecology, 116 South Michigan Avenue, Chicago 3, Illinois.

ACADEMY OF PSYCHOSOMATIC MEDICINE

The first annual meeting of the Academy of Psychosomatic Medicine will be held at the Plaza Hotel, New York City, on October 8 and 9. The topic of the program will be "Psychosomatic Aspects of Surgery." Applications for fellowship and associateship are still being received by the secretary, Dr. Ethan Allan Brown, 75 Bay State Road, Boston 15, Massachusetts.

AMERICAN ELECTROENCEPHALOGRAPHIC SOCIETY

The eighth annual meeting of the American Electroencephalographic Society will be held at the Hotel Claridge, Atlantic City, June 11 through 13. Dr. Robert S. Schwab, of Boston, will be the chairman of a symposium on "The Rhinencephalon," and Dr. A. Earl Walker, of Baltimore, will be the moderator of a panel on "Medico-Legal Aspects of Clinical Electroencephalography."

POSITION IN QUARTERMASTER RESEARCH CENTER

A position is available for a male physician to take charge of a dispensary in a large new federal research organization in Natick, Massachusetts. The salary is $7000 a year for a forty-hour week. Information may be obtained from the Personnel Officer, Quartermaster Research Center, Natick, Massachusetts.

BOSTON MEDICAL HISTORY CLUB

The Boston Medical History Club will meet at the Boston Medical Library, 8 Fenway, Boston, May 3, at 8:15 p.m. Dr. Douglas Guthrie, University of Edinburgh, Scotland, will speak on the subject "Drugs and Herbals." There will be a small exhibition of herbals.

SOCIETY MEETINGS AND CONFERENCES

May 1. State University College of Medicine at New York City. Alumni Association. Page 400, issue of March 4.
May 2. International College of Surgeons. Page 492, issue of March 18.
May 3. Civil Defense Exercise. Page 664, issue of April 15.
May 3. Boston Medical History Club. Notice above.
May 3–7. Yale University Silliman Lectures. Page 585, issue of April 1.
May 3–26. Consultation Clinics for Crippled Children. Page 705, issue of April 22.
May 6. Cutter Lecture. Page 708, issue of April 22.
May 10. New England Cardiovascular Society. Henry Jackson Lecture. Page 708, issue of April 22.
May 10–12. Institute of Industrial Health. Page 491, issue of March 18.
May 11. Harvard Medical Society. Page 707, issue of April 22.
May 12. Middlesex East District Medical Society. Annual Meeting. (Harlow Dinner.)
May 12. Essex North District Medical Society Meeting. Andover Country Club, Andover.
May 12. New England Obstetrical and Gynecological Society. Spring Meeting. Longmeadow Country Club, Springfield.
May 14–16. Fifth Annual International Group of Doctors in Alcoholics Anonymous. Page 1004, issue of December 10.
May 14–16. American Academy of Dental Medicine. Page 38, issue of January 7.
May 15. Massachusetts Hospital School. Orthopedic Rounds. Page 265, issue of February 11.
May 17–23. National Tuberculosis Association. Page 663, issue of April 15.
May 18–20. Massachusetts Medical Society. Annual Meeting. Hotel Statler, Boston. Page 740.
May 21. Boston Lying-in Hospital Journal Club. Page 38, issue of January 7.
May 27 and 28. New York Surgical Division of International College of Surgeons. Page 585, issue of April 1.
May 27–29. American College of Cardiology. Page 585, issue of April 1.
May 31–June 3. American Urological Association. Page xvii, issue of July 23.
June 5 and 6. International Association for the Study of the Bronchi. Page 400, issue of March 4.
June 11–13. American Electroencephalographic Society. Notice above.
June 13–17. American Society of Medical Technologists. Page 444, issue of March 11.
June 14–16. American Neurological Association. Page 540, issue of March 25.
June 15–18. Medical Library Association. Page 491, issue of March 18.
June 17–19. American Geriatrics Society. Page 266, issue of February 11.
June 17–21. Pan American Congress of Ophthalmology. Page 540, issue of March 25.
June 19 and 20. Society for Investigative Dermatology. Page 540, issue of March 25.
June 23. Tufts Medical Alumni AMA Dinner. Page 585, issue of April 1.
July 22 and 23. International College of Surgeons. Regional Meeting. Page 828, issue of November 12.
July 23–29. International Cancer Congress. Page 914, issue of November 26.
July 26–31. International Congress of Gynecology and Obstetrics. Page 400, issue of March 4.
August 17–20. Argentine Congress of Thoracic Surgery. Page 708, issue of April 22.
September 6–10. International Poliomyelitis Congress. Page 399, issue of March 4.
September 7–10. Nineteenth Annual Congress of the United States and Canadian Sections of the International College of Surgeons. Page 828, issue of November 12.
September 12–15. Second International Congress of Cardiology. Page 44, issue of July 2.
September 16–18. American Heart Association. Annual Scientific Sessions. Page 44, issue of July 2.
October 8 and 9. Academy of Psychosomatic Medicine. Notice above.
October 27. New England Obstetrical and Gynecological Society. Annual Meeting. Hotel Somerset, Boston.
December 13–17. Congress of Obstetrics and Gynecology. Notice above.
June 21–25, 1955. National Association for the Prevention of Tuberculosis. Page 540, issue of March 25.

CALENDAR FOR THE WEEK BEGINNING THURSDAY, MAY 6

THURSDAY, MAY 6

*8:00–8:45 a.m. Case Presentations. Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
*9:00–10:00 a.m. Arthritis Grand Rounds. Robert Breck Brigham Hospital.
10:30–11:15 a.m. Lecture on Diabetes for Doctors and Patients by a Member of the Joslin Clinic. Joslin Auditorium, New England Deaconess Hospital.
11:00 a.m. Staff Conference. Intervertebral Disks. Dr. W. J. Mixter, Regional Office of the Veterans Administration, Conference Room, 4th floor, 17 Court Street, Boston.

(Notices concluded on page xix)